Munich – City of Knowledge
Munich – City of Knowledge
This study is a follow-up of the booklet "Munich – City of Knowledge" published in 2002. The ability of creating and exchanging knowledge is becoming the decisive criterion of modern economic centers, knowledge a decisive resource. In this competition, the function of cities as hubs of competing regions is highlighted because even in an age of modern means of communication, direct contacts and individual exchange remain an important basis for business, networks and cooperation are the basis of a science city.

What is typical for a city of knowledge? Is it the institutions and establishments for gaining, communicating, storing or organizing knowledge? Or is not, in the first place, the mixture of all these establishments and institutions which have a home in a city, especially their links and readiness for cooperation? For this is the only way by which knowledge and invention make innovation possible industrially and add attraction to a site. Information per se has no value, it gains value only by being assessed, weighted and put in a framework. A working knowledge and information management is the criterion by which organizations will be gauged in future. Modern information and communication media are considered as accelerators of this structural change, they help modernize the economies of countries whose typical feature is the increasing diversification of the services sector.

In addition to taking stock of Munich’s local infrastructure of knowledge, this study also identifies fields for action and strategies for the city. The communes can and must become actively involved in this development process. It is the combination of science and industry that makes Munich distinctive as a city of knowledge. Munich has a long tradition in this field. With the foundation of the Academy of Sciences and Humanities in the 19th century, the Ludwig-Maximilians-University, the foundation of the Technical University and the Polytechnical Society in Munich, this city has been a center of science since the turn of that century and a synonym of high-quality industrial products.

Munich is home to a broad manufacturing basis and a large number of research institutions. The economic prosperity of Munich can only be ensured if both sectors, i.e., science and industry, join forces. Because without direct contact with industry, no innovative production can evolve and, vice versa, industry cannot remain loyal to a site for a long term unless direct contact with research.

A total of 3,500 addresses was researched for the maps in this booklet, and all Munich-based companies with more than 500 employees interviewed for their research and development work. Like the first edition, this booklet is far from providing an exhaustive and complete description or even naming all knowledge-based establishments and companies in the Munich region. It does, however, provide a useful overview of what Munich makes typical as a city of knowledge: The great number and diversity of establishments, private research institutions, expenditure of companies on research and development, the patent cluster and the generally high level of science-based infrastructure which make Munich attractive as a center of science and industry.
Maps

Map 1 Knowledge clusters in Munich 4
Map 2 Comparison of major metropolitan areas 6
Map 3 Schools for training and further education in Munich 8
Map 4 Life-long-learning in Munich: adult and further education 10
Map 5 Universities and colleges in Munich 12
Map 6 Research and development in large firms in the Munich area 14
Map 7 Research and development in the manufacturing sector in the Munich area 16
Map 8 Research and development at universities and colleges in Munich 18
Map 9 Research establishments in the Munich area 20
Map 10 Software companies in the Munich area 22
Map 11 Telecommunication companies in the Munich area 24
Map 12 Medical technology companies in the Munich area 26
Map 13 Environmental technology companies in the Munich area 28
Map 14 Media companies in the Munich area 30
Map 15 Munich financial hub 32
Map 16 Technology transfer and assistance to start-ups in Munich 34
Map 17 Patent system in Munich 36
Map 18 Biotechnology cluster in the Munich area 38
Map 19 Health in the Munich area 40
Map 20 Munich as a traffic hub 42
Map 21 Libraries in Munich 44
Map 22 Museums and exhibition centers in Munich 46
Map 23 Theaters and music performance centers in Munich 48

Illustrations

Fig. 1 Knowledge in the city 5
Fig. 2 R&D cooperation among companies interviewed in the Munich area 17
Fig. 3 R&D cooperation of the companies interviewed with universities, colleges and other research institutions in the area of Munich 17
Fig. 4 Location of the principal R&D cooperation partners of the companies interviewed 17
Fig. 5 Take-offs and landings at Munich airport 43
Fig. 6 Passenger statistics of Munich airport 43

Tables

Table 1 Students at state and municipal schools in Munich 2004/2005 9
Table 2 Students at Munich’s universities and colleges (2003/04 winter term) 13
Table 3 Development of job statistics in the software industry 23
Munich – City of Knowledge

This society has changed from the industrial society to the knowledge society. In a knowledge society, big cities are primarily places in which new knowledge is produced and communicated. The aim of this booklet is to provide answers - in both textual and graphic formats – to the question of why Munich is a center of knowledge, innovation and creativeness.

Munich’s head start in knowledge

Munich occupies a prime position within the knowledge society: Knowledge is available in the city as a social and cultural resource and is the prime mover of industrial development. Knowledge as a resource can be acquired by the city’s population through education and life-long learning. Knowledge generates opportunities for participating in social life and is a precondition of skilled employment. Besides, technological and scientific knowledge in the city gives a leading edge in knowledge to be successful in the competition among cities and regions (cf. fig. 1 and see maps 1 and 2).

Fig. 1: Knowledge in the city

Knowledge is imbued with life in an environment ready to embrace it, exciting to advance into areas that are new and unknown. The desire for knowledge has a long tradition in Munich: To educate oneself, learn, acquire knowledge are all elements of historic development. Urban knowledge society builds on a diversified school system, renowned institutions for continuing education and adult education, universities and technical colleges. These institutions provide broad general education and also communicate intensive technical and expert knowledge (see maps 3, 4, and 5).

In a knowledge economy, knowledge is becoming increasingly important as a factor in production; in some cases, it has already overtaken labor and capital, the two traditional production factors: Knowledge is becoming a source of value added in the production of goods and the provision of services.

Research activities in companies, universities, colleges and numerous research institutions generate innovation in the product and processes sectors of technology-intensive industries and thus improve the city’s stance (see maps 6, 7, 8, and 9).

Industries such as medical equipment, biotechnology, information and communication technology, environmental technology, the media, and financial services are the prime movers of the knowledge-intensive urban economy. They attract investment and provide high-skill jobs and define the future fields of growth of this city by the Isar River (see maps 10, 11, 12, 13, 14, and 15).

A special feature of the urban economy of Munich is the variety of production clusters. The successful placement of high-tech industries in the world market is due to the regional concentration of innovation activities in clusters. Clusters while attracting new high-technology businesses and industries facilitate the actors in an interlinked network of relations access to technological know-how in the process of innovation. Such networks with actors in universities, research institutions and companies of any size often emerge around research, supporting and qualification establishments and with pioneering firms as nucleus. Based on trust, mutual benefit and frequent communication, these innovative environments are not mobile in space at random and are therefore crucial factors in the regional competition of sites (see maps 1, 16, 17, 18, and 19).

Even in the age of communication technologies, the exchange of knowledge among individuals remains an important component of cooperation also in the knowledge society. Fast and direct contact is an essential precondition for it (map 20).

An open approach to knowledge as a resource and an inspiring climate are important conditions to attract creative people and cause them to feel loyal to the city. This keynote is felt in places such as libraries, museums or theaters. They promote the culture of meeting knowledge and make people want to know more (see maps 21, 22, and 23).

Strategies and an action plan for improving Munich as city of knowledge are presented at the end of this booklet.
Comparison of major metropolitan areas

Educational level of employed persons in 2002

<table>
<thead>
<tr>
<th></th>
<th>University/college graduates</th>
<th>with vocational training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Munich</td>
<td>73</td>
<td>235</td>
</tr>
<tr>
<td>Dresden</td>
<td>53</td>
<td>226</td>
</tr>
<tr>
<td>Hamburg</td>
<td>53</td>
<td>202</td>
</tr>
<tr>
<td>Stuttgart</td>
<td>50</td>
<td>237</td>
</tr>
<tr>
<td>Rhein/Main</td>
<td>43</td>
<td>215</td>
</tr>
<tr>
<td>Leipzig/Halle</td>
<td>41</td>
<td>222</td>
</tr>
<tr>
<td>Cologne/Bonn</td>
<td>40</td>
<td>196</td>
</tr>
<tr>
<td>Berlin</td>
<td>37</td>
<td>170</td>
</tr>
<tr>
<td>Germany</td>
<td>30</td>
<td>206</td>
</tr>
</tbody>
</table>

Number of employed persons paying national insurance contributions per 1,000 population

Density of patent applications, 2000 filing status

<table>
<thead>
<tr>
<th></th>
<th>Private individuals</th>
<th>Science</th>
<th>Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Munich</td>
<td>24.9</td>
<td>5.9</td>
<td>96.6</td>
</tr>
<tr>
<td>Stuttgart</td>
<td>16.6</td>
<td>3.0</td>
<td>36.4</td>
</tr>
<tr>
<td>Cologne/Bonn</td>
<td>11.4</td>
<td>1.3</td>
<td>36.4</td>
</tr>
<tr>
<td>Rhein/Main</td>
<td>11.0</td>
<td>1.2</td>
<td>51.7</td>
</tr>
<tr>
<td>Germany</td>
<td>10.3</td>
<td>2.0</td>
<td>36.9</td>
</tr>
<tr>
<td>Hamburg</td>
<td>9.2</td>
<td>1.2</td>
<td>22.2</td>
</tr>
<tr>
<td>Berlin</td>
<td>8.9</td>
<td>3.4</td>
<td>17.7</td>
</tr>
<tr>
<td>Dresden</td>
<td>5.9</td>
<td>3.1</td>
<td>23.8</td>
</tr>
<tr>
<td>Leipzig/Halle</td>
<td>3.8</td>
<td>3.1</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Number of patent applications per 100,000 population

R&D expenditure in 2001 as function of gross value added

<table>
<thead>
<tr>
<th></th>
<th>Munich</th>
<th>Stuttgart</th>
<th>Rhein/Main</th>
<th>Dresden</th>
<th>Berlin</th>
<th>Germany</th>
<th>Cologne/Bonn</th>
<th>Hamburg</th>
<th>Munich</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per cent</td>
<td>3.78</td>
<td>5.78</td>
<td>2.18</td>
<td>2.18</td>
<td>1.92</td>
<td>1.74</td>
<td>1.74</td>
<td>0.70</td>
<td>0.30</td>
</tr>
</tbody>
</table>

R&D staff in 2001 as function of persons in gainful employment

<table>
<thead>
<tr>
<th></th>
<th>Munich</th>
<th>Stuttgart</th>
<th>Rhein/Main</th>
<th>Dresden</th>
<th>Berlin</th>
<th>Germany</th>
<th>Cologne/Bonn</th>
<th>Hamburg</th>
<th>Munich</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per cent</td>
<td>2.38</td>
<td>2.46</td>
<td>1.16</td>
<td>0.86</td>
<td>0.80</td>
<td>0.78</td>
<td>0.64</td>
<td>0.41</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Start-ups in 2001

<table>
<thead>
<tr>
<th></th>
<th>Munich</th>
<th>Rhein/Main</th>
<th>Cologne/Bonn</th>
<th>Hamburg</th>
<th>Berlin</th>
<th>Dresden</th>
<th>Leipzig/Halle</th>
</tr>
</thead>
<tbody>
<tr>
<td>per 1,000 population</td>
<td>10.0</td>
<td>8.8</td>
<td>8.4</td>
<td>8.2</td>
<td>7.8</td>
<td>7.7</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Munich - City of Knowledge
Department of Labor and Economic Development, 2005

Mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich
Metropolitan regions compared

Processes of Europeanization and globalization have made competition among cities and regions harsher. Knowledge as a resource has become a key factor in production and competition, mainly for new industries. Today, research and knowledge-intensive industries are the prime movers of innovation, growth and jobs. Where is Munich’s place here in comparison with other urban regions in Germany?

Munich – leading region of knowledge in Germany

In terms of economic power and quality of life, the Bavarian capital can regularly be found among the top performers in Germany in most different city ranking lists. Also, virtually all statistics with information on the innovation and competition capabilities of regions and their positions in the knowledge society, Munich is invariably among the best.

The companies’ high expenditure on research and development (R&D) and a good knowledge base are important factors for the successful research and development of a region. The intensity of R&D efforts undertaken by companies can be gauged by the proportion of money spent on R&D in relation to the economic power. In 2001, Munich-based companies spent well over 3 bn Euro on research and development; this was almost 3.8 per cent of the gross value added. This puts Munich on one of the foremost ranks (see map 2) and well over the 3-percent target set by the German government.

Another input factor is the number of jobs in research and development in relation to the total number of people in gainful employment. Again, with 238 researchers and developers in every 10,000 gainfully employed persons, Munich occupies one of the foremost places in Germany.

Besides, the success of the process of innovation increasingly depends on the availability of sufficiently trained personnel because along with the importance of knowledge-intensive products, the expectations companies have in the qualification and knowledge of their employees are constantly rising. In a comparison of cities, Munich is clearly top in Germany as regards the number of persons with high qualification, i.e., university or college graduates, with 73 graduates in every 1,000 inhabitants (see map 2). Also, the proportion of employees with completed vocational training is above-average in Munich.

The number of patent applications is a suitable measure for research and development output. Patents are important because they give companies with success in research a certain reassurance that they can realize pioneering profit from a monopoly position temporarily protected by patent. Munich occupies second place among the cities both in patent applications filed by Munich-based companies and also patents from science applicants. No other German metropolitan region has a larger number of patent applications filed by private applicants than Munich (see map 2).

The regional economy is in a process of constant change – companies expand, others shrink or disappear from the market altogether. New firms are of great importance to a sustained industrial development because creative ideas and innovations often come from new businesses. The high number of new companies formed (see map 2) and the positive balance of business registrations and deregistrations are indicators of how attractive a region is for new firms and underline the good business climate and developed culture of independence prevailing in Munich.

English Garden
The foundation: education, communication and accumulation of knowledge

A wide variety of schools and renowned institutions of training, further education and adult education are the basis on which the knowledge society of Munich thrives. Educational infrastructures, e.g., schools, communicate broad general knowledge and specialized institutions such as, e.g., universities and colleges, build intensive technical and expert knowledge. To attract creative people to receive training in Munich and stay here is a challenge which the region of Munich is facing, not least, by providing a number of high-quality training and further qualification establishments and a varied job market.

Schools in Munich

The choice of school and training opportunities belongs to the most critical decisions which define opportunities in life and the future of children and youth. They can choose from a wide variety of schools in Munich (see map 3). In addition to municipal and state-run schools, there are many private schools, among them three international schools offering general education. With 39 general and 78 vocational training schools operated and teachers paid by the municipality, Munich has the largest municipal school system in Germany. Equipped with some 26,000 computers and linked to a common education server, most municipal schools have introduced multimedia forms of teaching and learning.

General knowledge of the type taught at school is of great importance for orientation in the knowledge society. Also important is specialized knowledge taught at vocational schools. For one, because most young people undergo vocational training as a start-off into their working lives. For another, young people with excellent technical training strengthen the economy and make the region attractive to companies. A total of almost 190 vocational training schools in Munich (see map 3) teach many different occupations and can look back on more than 100 years of existence. As early as in the school year 1900/’01, the first vocational school opened in Munich. Georg Kerschensteiner – Munich’s inspector of school from 1895 to 1919 – founded this new school type with practical orientation, which put training for a job in focus. The “dual system” which is based on cooperation between schools and firms, is still regarded as a model world-wide and earned Munich the reputation of a city of schools. Since Kerschensteiner, the world of work, and along with it, the requirements on vocational training, have changed fundamentally: a new feature is the large number of skilled jobs requiring knowledge-based work, the number of jobs with little mental challenge is dropping dramatically; new careers have emerged, most of all in information and communication technologies and flexibility and life-long learning are expected in most cases. Munich is trying to meet these challenges with new teaching concepts and also by setting up new schools. In the meantime, Munich has 36 highly specialized and exquisitely equipped vocational training centers, among them the center on Bergsonstrasse which is considered to be the most modern competence center for electrical and information technology jobs in all of Europe.

Table 1: Students at state and municipal schools in Munich 2004/2005

<table>
<thead>
<tr>
<th>School type</th>
<th>Primary</th>
<th>Secondary</th>
<th>Junior high</th>
<th>Grammar School</th>
<th>Vocational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>128</td>
<td>48</td>
<td>23</td>
<td>37</td>
<td>189</td>
</tr>
<tr>
<td>Students</td>
<td>34,901</td>
<td>12,966</td>
<td>11,567</td>
<td>30,186</td>
<td>65,719</td>
</tr>
</tbody>
</table>

Source: Schulreferat LH München
Life-long-learning in Munich: adult and further education

Map 4

- Language schools
- Institutes for training and further education
- Principal locations of adult education centers

Source: Overview map. 1:500,000, Bayer. Landesamt für Vermessung und Geoinformation München, Nr. 1576/05
Survey and mapping. Institute of Social Geography, Ludwig-Maximilians-University of Munich
Life-long-learning in Munich: Adult education and further education

The development of the knowledge society has dramatic repercussions on the work environment. Longevity of vocational qualification is becoming a thing of the past and people are required to work in different occupations in the course of their lives. The knowledge acquired during a person’s original training is becoming obsolete ever more quickly. Therefore, people must be able to learn in new fields and add to their knowledge constantly.

An important actor in continuing and adult education is Münchner Volkshochschule GmbH (MVHS) (adult education center). With some 14,000 events and a quarter million participants every year, it is the largest European adult education establishment in public responsibility and with public support. The MVHS under responsibility of the city’s department of culture looks back at over 100 years of existence. It was founded as “Volks-Hochschul-Verein München” in 1896. Today, MVHS organizes life-accompanying learning in the fields of languages, health, culture, politics, labor and occupation, frequently in cooperation with other Munich-based cultural and educational institutions, universities, societies, associations and initiatives. Besides, the Munich adult education center provides accepted second-chance education and nationally and internationally accredited examinations in vocational training, and issues language diplomas. Courses, which can be attended by people from all walks of life and of any age, are run at 27 sites throughout the city (see map 4) and at 95 schools in Munich.

Training external to companies is provided mainly by chambers of trade and industry in Munich and by government-accredited state-wide organizations and sponsors of adult education (see map 4).

Besides, Munich is also a center of private further education and training. Specialized and widely diversified ranges of seminars are organized mainly by information technology and media companies, which have developed a strong basis in Munich. Many language schools and further education establishments are favorable situated near the city’s main railroad station, so that people traveling to Munich by train can reach them easily.

With Munich’s employment and qualification program, the city makes another important contribution to ‘life-long-learning’ in the urban area. The aims of the program include the occupational and social integration of individuals disadvantaged in the general labor market and also to meet the need for qualification by companies, most of all in new fields of employment. In 2002, the program had a budget of about 10 million Euro for some 60 different projects, measures and activities. In the same year, about 1,000 persons took part employment, training, qualification, consultation or mediation projects.
Universities and colleges in Munich

To build specialized expert knowledge is the task of eleven internationally renowned universities, colleges and universities of applied science with nearly 90,000 students in Munich. This makes Munich the second-largest university center in Germany, after Berlin.

The most traditional and largest university in Munich is Ludwig-Maximilians-University (LMU) with a present student population of some 46,000 – 16 per cent of them from abroad. More than 800 professors teach at 18 departments. The LMU is the focus of attraction for scientists representing the humanities, social and cultural sciences and a stronghold of the training of students of medicine, law and the natural sciences. The university management and administration the social, cultural and economics departments of LMU are located in downtown Munich (see map 5). New buildings requiring more land, such as the departments of medicine, veterinary medicine, biochemistry and physics, have – since the 1970s – been built at the outskirts of the city, in München-Grosshadern or to the north of Munich, in Oberschleisheim, Garching and Freising. An important biotechnology center has been built on the newly established HighTechCampus LMU in Martinsried in direct neighborhood to the hospital complex of Grosshadern (see map 5).

Munich’s second-largest university, Technical University (TU), is an internationally renowned research university with about 20,000 students, 20 per cent of whom come from other countries. The core competencies of the TU are in the natural sciences and technology, medicine and the life sciences. The university management and administration as well as the engineering, economics and sport sciences departments, architecture and medicine are located in the urban region of Munich. Located 30 km away from Munich, in Freising-Weihenstephan, is the Weihenstephan Center of Life and Food Science (WZW). The TU campus with the departments of physics, chemistry and mechanical engineering, mathematics and computer science is 15 km away, in Garching.

In comparison with the traditional universities, the Munich University of Applied Sciences is not a venerable temple of learning but a fairly recent establishment. It is the largest university of applied sciences in Bavaria and the second-largest in Germany with a student population of 13,000 and 470 professors. The 35 courses have all a high application and labor market orientation.

In addition to three big universities, Munich has numerous smaller institutions with specialized programs, e.g., the Academy for Television and Film or the University of Music and Performing Arts.

Munich profits from this strong knowledge base: Over 87,000 students from Germany and other countries not only make the city’s life more colorful and cosmopolitan, they are also an important reason for science-based firms to settle here where they find staff with the high qualification they need.

<table>
<thead>
<tr>
<th>Universities and colleges (2003/04 winter term)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ludwig-Maximilians-University</td>
</tr>
<tr>
<td>Technical University Munich</td>
</tr>
<tr>
<td>Bundeswehr University</td>
</tr>
<tr>
<td>Munich Institute of Higher Education for Politics</td>
</tr>
<tr>
<td>Munich School of Philosophy</td>
</tr>
<tr>
<td>Academy of Fine Arts</td>
</tr>
<tr>
<td>University of Music and Performing Arts</td>
</tr>
<tr>
<td>Munich Academy for Television and Film</td>
</tr>
<tr>
<td>Munich University of Applied Sciences</td>
</tr>
<tr>
<td>Stiftungsfachhochschule München</td>
</tr>
<tr>
<td>Munich Business School</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Source: Bayerisches Landesamt für Statistik und Datenverarbeitung
Research and development in large firms in the Munich area

Source: Overview map: 1:500,000; Bayer. Landesamt für Vermessung und Geoinformation, Nr. 1576/05
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich

Munich - City of Knowledge
Department of Labor and Economic Development, 2005
The research and development (R&D) activities of companies are considered to be important indicators for gauging the innovation potential of an urban region. Large companies are in the forefront of those engaged in R&D: they spend over four-fifth of the national expenditure on R&D and employ more than 80 per cent of the R&D staff. Therefore, the R&D activities of 227 large companies with 500 or more employees based in or around Munich were included in this study. Of these, 113 engaged in R&D activities during the last three years. For the prior study in 2002, firms of all sizes had been interviewed. So the current results cannot directly be compared with those of the earlier study.

In Munich, R&D activities take place in most different areas and fields of technology. The following research-intensive manufacturing industries make a particularly strong appearance in the R&D statistics (see map 7): information and communication technology (see maps 10 and 11), electrical engineering, the chemical and pharmaceutical industries, mechanical engineering and automobile industry as well as the space industry. For example, internationally renowned companies with a strong commitment to R&D, e.g., aerospace companies, have their headquarters in or around Munich (see map 7). Recently, EADS-Astrium has made sizable investments in the development of the civil Ariane rocket research and a solar center. Besides, Ottobrunn has been the principal place of business of Galileo Industries, the main contractor for the new European satellite navigation system Galileo, since September 2003. In addition to the co-ordination of development work for the first satellites to be launched into orbit by the end of 2005, all the required hardware and software development is sited in Ottobrunn, selected components are produced and all systems tested for full function.

The large companies with R&D interviewed belong to the following industries (see map 7): optical industry, medical equipment, instrumentation, textiles and clothing, food, building, media, paper, printing and publishing. Also small and medium-size companies representing biotechnology, environmental engineering and medical equipment, the growth sectors with a strong basis in Munich, are heavily engaged in research and development (see maps 12, 13, and 18). R&D is not a prerogative of manufacturing industries but also at home in knowledge-intensive service sector such as loans and insurance, corporate services as well as commerce (see map 6). Large companies have clear advantages when research requires high expenditure and a formalized approach is the quickest road to promise successful innovation. They have in-house R&D staff and in many cases run large R&D departments. In the Munich-based companies interviewed for this study, over 20,500 employees work in corporate R&D. Four-fifth of the companies interviewed have their own R&D staff.
Research and development in the manufacturing sector in the Munich area

Map 7
Manufacturing companies with over 500 employees

- Electrical engineering and communications
- Vehical engineering and mechanical engineering; aviation and aerospace
- Chemical and pharmaceutical industries
- Paper, publishing and printing, media
- Optical and medical equipment, instrumentation
- Textiles and clothing, food
- Building

Source: Overview map: 1 500,000; Bayer. Landesamt für Vermessung und Geoinformation, Nr. 1575/06
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich

Munich - City of Knowledge
Department of Labor and Economic Development, 2005
and over 60 per cent of all companies have R&D departments in Munich. For example, BMW operates a research and innovation center not far from the main factory in the north of Munich, which is considered to be one of the most advanced development centers in the automotive industry world-wide. Some 7,000 engineers, pattern makers, computer experts and researchers from various disciplines, plus procurement personnel and supplier staff do research and development work for the BMW Group’s cars and technologies of the future.

In addition to the generation of new knowledge, the ability of the companies to adapt technical knowledge from research institutions and other companies and to co-operate with these in the innovation process, is an essential component for technological capability. Nearly without exception, this ability can only be found in companies employing own R&D staff sufficiently familiar with R&D processes. Normally, cooperation with research institutions and with other firms is in addition to the internal R&D work and innovation efforts. Of the companies interviewed, over 80 per cent established R&D cooperation with other companies, universities, colleges or other research institutions. Over half of these companies work together with universities/colleges and other research institutes in the Munich area and also with other companies (cf. fig. 2). Those interviewed made frequent use of the diversified research infrastructure in Munich (see maps 8 and 9). Most ties of cooperation were with Munich’s Technical University, whose technological orientation most perfectly meets the profiles of the companies interviewed (see fig. 3).

Even in the time of modern communication technologies, personal contacts in development and research are important because the establishment and maintenance of relations of trust have proved to be inevitable in the harsh competitive environment among firms. This can be seen, inter alia, in the fact that one in every four companies said their principal cooperation partner in R&D was sited in the city or region of Munich (cf. fig. 4).
Research and development at universities and colleges in Munich

Map 8
Research sectors
- Linguistic and cultural studies
- Law, economics and social studies
- Mathematics, natural and engineering sciences
- Medicine
- Agriculture, forestry and nutritional sciences
- Other

Source: Overview map: 1:500,000, Bayer. Landesamt für Vermessung und Geoinformation, Nr. 1576/05
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Social Geography, Ludwig Maximilians-University of Munich
Research and development at universities and colleges in Munich

The universities and colleges are major actors for the generation of new knowledge in the regions of Munich. Their research and training activities are critical contributions to the innovation and competitive potential of the regions.

Munich’s universities and colleges (also see map 5) are engaged in research in almost all areas of the natural, engineering, social sciences and the humanities (see map 8). The Technical University (TU) and also Ludwig-Maximilians-University (LMU) rank high on different lists assessing the research results and success in the solicitation of external funds among research institutions in Germany. Totally, some 14,000 persons were employed in science and art departments of universities and colleges in the Munich region in 2003 (see map 8).

At the LMU, nearly 5,900 persons worked in research and teaching in 2003. As Munich’s largest university, LMU has the required critical mass for team work with excellent results not only in the social sciences and the humanities but also in the natural sciences. For example, the Center for NanoScience (CeNS), founded in 1998, bundles the competencies of LMU in the nanosciences. Excellent opportunities for linking academic with industry-oriented research are provided by the HighTechCampus of LMU in Martinsried-Grosshadern. Located in the direct neighborhood of the hospital complex of Grosshadern, the research institutes of the Max Planck Society and an Innovation Center for Biotechnology (IZB), the LMU Biocenter, which opened in 2004, and the Gene Center, in addition to the pharmaceutical and chemical departments.

Munich Technical University (see map 8) employed some 5,100 research and teaching staff in 2003. The TU’s research competencies are mainly the natural sciences and technology, medicine and the life sciences. Contacts with regional, national and international companies are close: In 2003, the TU won external funds in an amount of 124.5 million Euro from public and private sources. Main fields of research at the TU are, e.g., plant breeding and nutrition-related green biotechnology which is concentrated in the Weihenstephan Center of Life and Food Science (WZL). Besides, the Munich TU has an outstanding research institution at the Garching campus: the research neutron source Heinz Maier-Leibnitz (FRM-II). It attracts scientists from all over the world who use neutrons generated at the facility for fundamental research in physics, chemistry, biology and the materials sciences.

The Munich universities also maintain close research ties with other universities and colleges, government-funded research establishments and industry. At present, Bavaria is home to 15 research cooperations and associations working on interdisciplinary, application-oriented research projects studying current social, economic and technological issues. Their common platform is the Association of Bavarian Research Cooperations (abayfor). The Munich universities are represented on 14 of these research cooperations.

Close partnership among universities and colleges is useful mainly in translating scientific inventions into marketable innovations. For example, the technology transfer centers of LMU, TU and the Munich University of Applied Sciences (see map 16) try to successfully bring together knowledge from research with high-tech firms.
Research establishments in the Munich area
Research establishments in the Munich area

The public and semi-public research establishments complement the research activities of the universities and private industry in areas in which due to the subjects, interdisciplinary approach or scope of projects, universities and colleges are not the optimal partners.

Munich has a high density of public research establishments in the natural sciences, economics and social sciences. In addition to renowned research institutions such as the Bavarian Academy of Sciences and Humanities, 25 institutes of the Max Planck Society, the Fraunhofer Society, the Helmholtz Association and the Leibniz Association have settled in Munich (see map 9). They are important factors in the successful development of the knowledge-intensive clusters in the city. The spatial closeness of the institutes to the technology-based companies enables research cooperation and the transfer of knowledge as boosters of the innovation potential of industry.

Some 3,750 employees of 13 Munich-based institutes of Max Planck Society, whose general administration is also located in Munich, are engaged in research in the natural and life sciences. The Max Planck institutes for biochemistry and neurobiology in Grosshadern-Martinsried support for example, the small and medium-size companies of the so-called red biotechnology with their medical and pharmaceutical research.

Whereas the Max Planck Society concentrates on fundamental research, the Fraunhofer Society focuses on application-oriented research in the engineering disciplines. Five research establishments are based in Munich, among them the Society’s headquarters and its patent center, which acts as consultant and provides financial support to companies in obtaining patents for their inventions from the German Patent and Trade Mark Office and the European Patent Office.

The Leibniz Association is also represented in Munich with four institutes: the DFA – German research institute for food chemistry, the Deutsche Museum, the ifo Center for Economic Studies and the Ifz – Institute of Contemporary History. These four institutes together have a budget of 54.59 million Euro and a total staff of 660.

The Helmholtz Association is the largest science organization in Germany and engages in application-oriented development as well as fundamental research. Three of 15 research establishments run by the Helmholtz Association are resident in the Munich area: the German Aerospace Center in Oberpfaffenhofen, the Max Planck Institute for Plasma Physics in Garching and the GSF National Research Center for Environment and Health in Neuherberg.

In addition to the public research institutes, Munich is also center to 13 institutions of an industry-based innovation network, some of which are affiliated to universities or colleges (see map 9): The German Federation of Industrial Research Associations “Otto von Guericke” supports R&D projects undertaken by small and medium-size companies and acts as a consultant for practical innovation. In Munich, the association concentrates its activities on projects in nutrition, e.g., at the Weihenstephan science center.
Prime movers of urban economic development: knowledge and technology intensive branches

Knowledge and technology-intensive branches are the prime movers of regional urban development. They are the backbone of investment, employment and sustainable jobs in the knowledge economy. Especially successful sectors and future growth industries in Munich are medical equipment, biotechnology, information and communication technology, the media industry, financial services, the aerospace and automotive sector. These industries secure the international competitiveness of Munich.

Software industry in the Munich area

Information technology (IT), which comprises both software and hardware, is one of the key technologies of the 21st century. It is the principal driving force of technical advance.

Going by the number of firms, Munich takes pride of place, followed by Berlin and Hamburg. Large companies, such as Siemens AG and big international players with a branch or a subsidiary in Germany, e.g., Microsoft Deutschland in Unterschleissheim or Cisco Systems GmbH in Hallbergmoos, have a formative influence on the IT industry in the area of Munich (see map 10). Numerous small and medium-size IT companies providing highly specialized products or services are also typical of Munich.

With about 8,300 businesses, the software industry is the largest IT segment in the area of Munich. The portfolios of the software industry comprise web hosting, software development and consultation as well as data processing and data acquisition.

Munich’s software industry, including e-commerce firms, had a total turnover exceeding ten billion Euro in 2003, which is 15 per cent of the total earnings of the German information and communication industry.

The software industry is a major employer in the region: In the last few years, the number of employees went up to over 54,000 in 2003 (cf. table 3).

Software firms find Munich a site with ideal conditions: They can hire highly qualified personnel, use a specialized infrastructure, e.g., technology transfer points and an extensive potential customer base. Users of software systems are the knowledge and technology-intensive sectors, e.g., biotechnology, medicine, aerospace industry, media firms, the automotive sector, producers of car electronic equipment and mechanical engineering companies. Numerous spin-offs of the computer science departments at Munich’s universities and colleges add to the growth of the industry.

Political and financial support is available to the industry under the Bavarian Software Initiative, initiated by the Bavarian state government in 1998. The focus of the software initiative is on research, company foundation and qualification.
Telecommunication companies in the Munich area

Source: Overview map: ©2000, Bayerisches Landesamt für Vermessung und Geoinformation, Nr. 19/005
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-Universität of Munich

Munich City of Knowledge
Department of Labor and Economic Development, 2005
The telecommunication industry in the Munich area

More often than ever before, data, information and knowledge are transmitted by electronic means. The telecommunication industry provides the required equipment and infrastructure for it. The deregulation and privatization of telecommunication during the 1990s was the starting point of strong competition leading to dynamic growth in this young, technology-driven industry. Today, Munich is the second-largest telecommunication center in Germany, after Frankfurt am Main. Over 100 telecommunication firms in Munich and the area around it (see map 11) achieved a turnover of 14.7 billion Euro in 2003, one fifth of the total revenue of the Munich-based information and communication sector; investments amounted to about 3.1 billion Euro and the industry employed short of 19,000 people.

Some telecommunication companies in the Munich area have global activities, e.g., Siemens AG, O₂ GmbH, or BT Germany. Besides, network operators, UMTS license holders, network carriers and internet service providers also are part and parcel of this industry in Munich.

Carriers are telephone companies and service firms specializing in the transport of data and voice and selling or leasing services of their own systems. In addition to the original telecommunication firms, such as Deutsche Telekom AG, electricity supply companies, such as E.ON, also act as carrier. A separate line network in Munich is operated, e.g., by the city carrier M‘net, co-founded by Munich’s municipal utility in 1996, which operates some 1,300 km of glass fiber cable for telephone and internet services in the areas of Munich, Ingolstadt, Nürnberg, Erlangen and Fürth.

M‘net has become one of the leading regional telecommunication service providers. In addition to 77,000 private customers, M‘net also has 7,500 business customers.

In connection with the introduction of UMTS technologies, the mobile radio standard of the third generation, Munich turned into a virtual hub for this within Germany: In addition to O₂ with headquarters here, all other UMTS license holders, such as E-Plus, Vodafone, and T-Mobile are present in Munich.

Besides, a wide range of firms providing internet services has settled in Munich; they cater for the needs of corporate and private customers by providing hosts and servers for the storage of home pages and data bases (see map 14).

The periodical Focus referred to Munich as the ‘internet capital of Germany’. One in four internet firms has its principal place of business in Munich and 24 per cent of all German internet start-ups are at home in the Munich area (see map 14).
Medical technology companies in the Munich area
With annual growth rates of five to six per cent in Germany, the medical technology industry is a prime mover of economic development with favorable job prospects.

Over 200 producers of medical technology are concentrated in the area of Munich (see map 12), they employ about 14,000 people. Thus, about one in three employees in this industry in Bavaria is posted in the Munich area.

The city and district of Munich were among the territories with the largest number of new medical technology companies formed in the period from 1995 to 2002. The background of this encouraging development is the favorable site factors which Munich provides: a strong basis of university and other research institutions (see maps 8 and 9) which turn out highly qualified graduates and also act as cooperation partners for start-up firms. Besides, the scientific research institutes often are the basis for spin-offs.

On the other hand, the large number of hospitals and resident doctors in Munich generates extensive potential demand (see map 19). Another factor is that industries which are of special importance to innovation in medical technology, such as biotechnology, nanotechnology and computer technology, are strongly represented in the urban region (see maps 10 and 18). Also important for the medical technology industry is the local presence of independent certification agencies, such as TÜV, which issue the CE label – a statutory requirement for any medical technology item.

In terms of size, small and medium-size firms with less than 50 employees dominate in and around Munich. Only a few companies employ more than 100 people. Examples of these firms are the highly traditional company Rodenstock in downtown Munich or the company Stöckert Instrumente, a supplier of heart-lung machines. Located in the area around Munich are several other larger companies, for example, BrainLAB, a supplier of cancer treatment software, or the supplier of diagnostic instruments and precision optical products, Heine Optotechnik, in Herrsching. Besides, the GE Global Research Center of the global technology group General Electric in Garching has a development and research department specializing in medical technology in the area of Munich.
Environmental technology companies in the Munich area

Map 13

Environmental technology companies with focus on:
- Waste management and recycling
- Renewable energies and energy saving
- Noise reduction and clean air
- Water treatment and water saving
- Cleaning, contamination and soil rehabilitation
- Instrumentation
- Environmental consultants

Source: Overview map: 1:500,000; Bayer. Landesamt für Vermessung und Geoinformation, Nr. 1576/06
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich

Munich - City of Knowledge
Department of Labor and Economic Development, 2005
Environmental technology in the Munich area

The environment sector has experienced a dramatic technical development since the 1980s, making environmental technology an important growth sector today.

Numerous firms in this shared-service industry have their centers in or around Munich. The positive dynamic development in environmental management in Munich is illustrated by the fact that the number of jobs in this industry increased by almost 30 per cent in the years from 1994 to 2003. If the jobs created in the craft and trades sector and in the municipal waste disposal and waste water treatment facilities in the city and region of Munich are included, there were almost 9,000 jobs in environmental technology in 2003.

Going by turnover, the most important environment technology segment in Munich is waste management and recycling, followed by rehabilitation of contaminated sites and renewable energies. An important supplier of environmental technology and strongly based in the area of Munich are instrumentation and control systems and many environmental consultants also have their offices here (see map 13). Most local firms in environmental management are small or medium-size with activities not only in environmental technology but also in other fields.

Munich is a German leader also in renewable energies, most of all photovoltaics, geothermal energy and biomass utilization, which are considered to be the most innovative segments of the environment industry. Munich is not only home to a number of producers, e.g., of solar cells, it is also the center of development and research in this field. The research and development center set up by General Electric (GE) in Garching in 2004 employs about 150 people and also does research and development in the production of renewable energies. The dynamic field of fuel cell technology is also of great relevance in Munich. Many firms in this segment succeeded in becoming European market leaders with their innovations.

The Munich area is the base from which many university and non-university research institutions carry on important environmental activities, e.g., the GSF – National Research Center for Environment and Health (see map 9). These institutes do research in the fields of energy, waste and water management, plant construction, combustion and fuel cell technology.

Munich is an attractive site for environment firms also because the city itself has a strong commitment to renewable energies and their use and has instituted environment awards and initiatives such as the ÖKOPROFIT environmental consultation program for companies and supports the regional environment industry. In 2005, Deutsche Umwelthilfe (German environment aid) named Munich winner of the “German energy saving capital” competition among cities and towns.

Moreover, Munich is the place of important authorities, such as the Bavarian State Ministry of the Environment, Public Health and Consumer Protection and the municipal Department of Health and Environment. Besides, environmental societies and agencies, e.g., Deutsche Gesellschaft für Sonnenenergie (German solar energy society), have their principal offices in or near Munich. The internationally most important environment exhibition – IFAT – takes place in Munich every three years.
Munich as a center of the media

Television, radio, the print media and the internet are not only means for knowledge storage and transmission, the media are also a knowledge-intensive and promising industry offering many jobs in Munich. Hardly any other city in Germany has profited more from the media boom during the last few decades than the Bavarian capital. Contrary to the general trend in the industry and despite the difficult situation in the media industry, the print, multimedia, advertising and information services segments have been growing in recent years. For example, the number of media companies in and around Munich went up from 11,425 to over 14,000 in the period from 1999 to 2002, the number of permanently employed and freelance persons rose from 116,000 to 187,000 and the turnover of the industry increased from 19.2 bn. Euro to 24.5 bn. Euro.

Munich is positioned excellently both in the traditional audio-visual media, such as radio and television, and also in the new media segment and the internet industry (see map 14). In addition to the Bayerische Rundfunk, with over 4,000 permanent and freelance radio and television workers in Munich, and Zweites Deutsches Fernsehen (ZDF), most national private television companies can be found in and around Munich (see map 14). There are more than ten local radio stations in the city. The area of Munich has the highest density of studio and production capacity and is the center of German film production. As for each film, radio or television product the most diverse talents and services must be brought together, a comprehensive supply industry has sprung up in Munich: studio operators and production firms, film technicians, casting agencies and even film distribution companies. Many of them can be found in the downtown area or in one of the media clusters (see map 14). Synergy effects due to the closeness of sites are of particular importance in this industry with its intensive division of labor. More than 1,000 people work on the premises of Bavaria Film. It is the site of the Bavaria Film group, two radio stations and almost 30 other independent firms providing different film-related services (see map 14). Even in the print segment, the traditional main pillar of the local media industry, Munich is top in Germany, with internationally acclaimed publishers such as C.H. Beck and Langenscheidt: In 2003, a total of 234 Munich-based publishers put out the largest number of titles in all of Germany (8,527 titles). The picture of Munich as publishing center is complemented by five daily newspapers, some of them with supraregional readership, and the editorial offices of about 200 general and technical periodicals.

The local concentration of media, most of all, IT companies, has made the city a preferred site of firms with activities in the new media, i.e., internet service providers, web agencies und e-commerce (see map 14). This young, innovative industry is looking forward to a promising future: first, because access to the internet is common practice for half the German population – and the figure will go up further –, second, the conventional media are in a process of merging with the contents of the information and communication industry: for example, interactive television or video-on-demand are options of new hardware and software solutions.

One of the strong points of Munich is also the large number of well-known media training and education institutions, such as the universities, the Bayerische Filmzentrum (Bavarian filmcenter) Geiselgasteig or the Deutsche Journalistenschule (German school for journalists). They turn out a stream of well-trained and – most of all – creative graduates, probably the most important factor pro settlement in Munich.
Banks also find Munich an attractive place to do business from. Some 160 banks can be found here; about 50 of them manage their business from a Munich HQ (see map 15).

The bank landscape of Munich is varied. Cooperative banks and savings banks add to the range of financial service providers. Banks with international services in Munich include HypoVereinsbank and Bayerische Landesbank. In addition to these, a large number of private banks takes care of the needs of their clients. Munich is also a preferred place for domestic and foreign venture capital firms (see map 15). Almost one in two venture capital firms in Germany is head-quartered in Munich. Venture capital is a ‘must’ for innovative and knowledge-based start-ups, which often do not have the necessary capital to fund their business. Reasons why venture capital firms find Munich most attractive are: for one, the large number of young, innovative companies – at present, one in three firms financed with venture capital is located in the Munich area. Secondly, the presence of capital available for new forms of investment.

To strengthen and maintain Munich’s attractiveness also in future, important companies, institutions as well as scientific and government entities have formed the “Munich Financial Center Initiative”.

Product and process innovations also take place in the service sector. Financial services, in particular, are knowledge-intensive and provide a large proportion of jobs requiring high qualification. Besides, new knowledge often needs capital to make it work. Therefore, the availability of venture capital is an important factor for siting young, technology-oriented companies. Munich is a major financial center in this respect: After Frankfurt, Munich is Germany’s second most important center of the banking sector, the Number One place for insurance companies, and also a top location for asset management firms, funds, leasing companies and venture capital firms. In 2003, over 60,000 people, i.e., over nine per cent of all employees paying social contributions in Munich, were employed in the loan/credit and insurance sectors.

The Bavarian capital is Germany’s largest insurance center both by the number of people working in the insurance sector and the total revenue earned from insurance premiums. Nearly 80 insurance companies have their headquarters in Munich (see map 15). They include large groups, such as Allianz, the world’s largest primary insurer, D.A.S., Europe’s largest defense insurer, and the Bavarian insurance chamber, the biggest public-law insurance group in Germany. Reinsurance companies have a particularly strong presence in Munich: The Münchener Rück, the world’s largest reinsurance company, has headquarters in Munich. Other companies in this segment, such as Swiss Re or GE Frankona Re, manage their business activities from Munich. Just over 60 per cent of the reinsurance business in Germany, namely some 33 bn. Euro a year, were handled in the Munich area in 2003. The asset management sector of the insurance groups and the companies formed for this purpose handled some 860 billion Euro in 2000. Thus, Munich now ranks before Frankfurt am Main in asset management.
Technology transfer and assistance to start-ups in Munich

Source: Overview map: 1 500 000, Bayer. Landesamt für Vermessung und Geoinformation, Nr. 1575/05
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich
Synergies in the city of knowledge: institutions of knowledge transfer and knowledge clusters

Networks of actors from universities, colleges, research establishments and companies of all kinds and size spring up around research, support and qualification institutions and pioneering firms. The numerous institutions for technology transfer and for supporting start-ups, plus their location close to the patent institutions in Munich, provide an encouraging environment especially for research-intensive clusters, e.g., biotechnology and the health system.

Technology transfer and support for company founders in Munich

Munich is the place for many quality institutions specializing in technology transfer and the formation of firms and acting as consultants to and assisting up-and-coming companies: technology transfer points, technology and founder centers, so called incubators and accelerators, founder consultants and start-up and venture capital lenders (see map 16).

Technology transfer points encourage the intensive networking of science and industry. They assist in the search for suitable cooperation partners, make contacts with know-how owners and engage in active knowledge transfer. For example, Munich’s universities, several research institutes, such as the German Aerospace Center, the patent offices and the Bavarian State Ministry of Sciences, Research and the Arts have their own technology transfer points.

The Munich Technology Center (MTZ), which was initiated by the city, also communicates technological knowledge and provides science and technology-oriented firms with low-rent space, services, consultation and marketing. The target of settlement in the MTZ and the other 13 founder centers in the city is to improve the start-up and growth opportunities of future-oriented, high-risk firms.

A similar function is that of the so called incubators and accelerators of local industry which, in addition to fully equipped rooms and office services provide industry competence and venture capital in the IT, multimedia and life sciences sectors.

The supply of venture capital by a number of venture capital companies and venture capital providers in the area of Munich makes it easier for firms to develop innovative technical products and processes (see map 15).

The diversified infrastructure for technological knowledge transfer and support of companies in the starting and growth phases, plus a number of initiatives, e.g., the Munich business plan competition, provide excellent framework conditions for start-ups in Munich. This also includes the Munich Business Startup Office (MEB), a cooperation of the Chamber of Industry and Commerce with the Department of Labor and Economic Development of the City of Munich. The MEB provides interested parties with free consultation and information on all matters of business formation. A favorable climate for the formation of new firms was also confirmed by studies undertaken by the universities of Cologne and Lüneburg: Potential business founders and start-up firms ranked the economic region of Munich number one.
Patent system in Munich

Source: Overview map: 1 500 000; Bayer. Landesamt für Vermessung und Geoinformation, Nr. 157/06
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich
The generation of new knowledge in the form of inventions and innovations is crucial to the competitiveness of a region. A high number of patent applications is an indicator of intensive research and development activities in a region.

As the site of the German Patent and Trade Mark Office and the European Patent Office, Munich occupies a key position in the German and European patent systems (see map 17). The German Patent and Trade Mark Office, the central institution for copyright and intellectual property protection in Germany, received applications for totally 48,448 domestic patents in 2004. The locations of the patent applicants concentrate very much on a few regions with high economic success. In addition to Stuttgart, Munich has for years been the region with the highest number of patent applications in Germany. Altogether 14 per cent of all domestic and one third of all Bavarian patent applications come from the Munich region. The strong focus on technology and innovation in the area of Munich can also be seen in the high patent density: by head of population, twice as many patent applications are filed here than on the German average (see map 2).

Most patents from Munich-based applicants are filed for inventions in electrical engineering, electronics and radio communication, health, instrumentation and control systems. Munich is consistently cementing its leading position also in biotechnology patents with eleven per cent of all domestic patent applications in biotechnology.

Looking at the patent applications by categories of filers, i.e., industry, science or private inventors, it will be seen that most applications are the result of industrial research.

Most patent applications in Germany have for years been filed by the Munich-based Siemens AG. There are another three Munich companies among the top-20 filers: Infineon Technologies, Bayerische Motoren Werke (BMW) and BSH Bosch und Siemens Haushaltgeräte.

Munich's importance to the patent system is also illustrated by the large number of institutions with offices here, such as the patent department of German research of the Fraunhofer Society or the Max Planck Institute for Intellectual Property, Competition and Tax Law (see maps 9 and 17). In addition, there exists a close network of information offices and service providers specialized in patents. Numerous technology transfer and inventor consultation centers in Munich provide services for the mediation and marketing of innovations from universities, colleges, research institutes and firms (see maps 16 and 17).

Moreover, with one in three practicing patent lawyers as well as publicly appointed and sworn patent experts come from the Munich region; this is the highest density in this category in Germany.

With the Munich Intellectual Property Law Center and the European Patent Academy, Munich also plays an important role in training and further education in the patent system (see map 17).
Biotechnology cluster in the Munich area

Map 18

Source: Overview map: 1,500,000. Bayer, Landesamt für Vermessung und Geoinformation, Nr. 1576/06
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich
The biotechnology region of Munich

The city of Munich and the surrounding region has developed into one of Germany’s most successful biotechnology clusters during the last ten years and is a leader among the international biotechnology regions. A particular advantage of the Munich-based biotechnology firms is that the Bavarian capital with its research institutions in the natural sciences and the life sciences, competent application centers in the health care sector and a multitude of medical equipment companies (see maps 12 and 19) has a high life science profile. Munich’s life science sector provides almost 24,000 people with jobs, many of them in research.

Meanwhile, about 100 biotechnology firms, most of them small or medium-size, and over 20 larger pharmaceutical companies (e.g., Bristol-Myers Squibb GmbH, GlaxoSmithKline GmbH & Co KG) are sited in and around Munich. Most of them concentrate on medical and pharmaceutical development and biotechnological application (red biotechnology) but are also active in green biotechnology (plants and food), bioinformatics and the manufacture of biotechnological implements and reagents (see map 18). The small and medium-size firms (SMEs) of the industry have over 2,200 employees, more than one in two of these working in the development of therapeutic and diagnostic drugs. In addition to those employed in the biotechnology SMEs, another about 8,000 people work in branches or subsidiaries of international or local pharmaceutical companies.

Major factors of the success of the biotechnology companies in the area of Munich include: close cooperation with many well-known research and teaching institutions in the life sciences, the availability of capital from technology-oriented lenders, specialized service providers, extensive support and technology transfer (see map 18) and a large pool of personnel with excellent training.

Grosshadern-Martinsried: red biotechnology cluster

Grosshadern-Martinsried has become known as a center of red biotechnology (see map 18). In addition to many other biotechnology firms close by, the Max Planck institutes of biochemistry and neurobiology, the Grosshadern complex of hospitals, several science departments and the genetic center of the university of Munich (LMU) as well as the innovation center for biotechnology (IZB) are located there. The Bio² AG, the coordination center of the Munich biotechnology region, is also sited there. Meanwhile, more biotechnology companies have set up facilities in nearby Gräfelfing and Planegg.

Freising-Weihenstephan: a center of green biotechnology

A center of green biotechnology has been established in Freising-Weihenstepahn, in the north of Munich. The firms set up there in the last few years have the advantage of being in direct neighborhood of the Technical University of Munich, which has expanded its science center for nutrition, land use and environment, and Fachhochschule Weihenstephan, Germany’s largest “green” university of applied sciences, (see map 8). The application and research cluster established here is complemented by other research and support institutions such as the Bavarian State research center for agriculture (LfL), the Bavarian State brewery Weihenstephan, the Fraunhofer Institute for Process Engineering and Packaging (IVV) and another innovation center for biotechnology (IZB).

The Munich Technology Center (MTZ) and the municipal industry estates offer biotechnology start-ups with space and services. Another attractive site for biotechnology firms, the Freiham life science park, initiated by the municipality, is emerging at the western fringe of the city.
Health in the Munich area

Map 19

- Hospitals (by supporting institution)
  - University
  - Municipality, district, region
  - Non-profit
  - Private
- Companies*
  - Medical technology
  - Pharmaceutical companies
  - Research establishments*
  - Medical technology oriented
- Supporting infrastructure*
  - Consultation and technology transfer
  - Financial services
  - Patent lawyers

* to biotechnology sub-cluster see Map 18

Munich - City of Knowledge
Department of Labor and Economic Development, 2005

The public health system in the Munich area

Health management is a growing industry. Its importance is growing in view of the demographic change and also due to new developments in diagnostic methods and available treatment options. In addition to hospitals, doctors’ surgeries, pharmacies and other health care institutions as core institutions, health management also includes the pharmaceutical, biomedical and medical engineering industries and research institutes.

Health is one of the most employment-intensive service sectors of all, with some 100,000 jobs in and around Munich alone. Three first-rate university hospitals, over 70 municipal, non-profit or private hospitals with more than 13,000 in-patient beds and about 4,000 medical doctors (see map 19), plus a multitude of doctors’ practices and laboratories in the area, provide a high level of health care. The city of Munich alone runs five large hospitals with almost 4,000 beds, which have merged to form the Klinik München GmbH and provide all main areas of treatment.

Whereas the biotechnological and pharmaceutical industries (see map 18) develop new drugs and methods for treatment of in-patients and out-patients, the medical technology companies develop and supply medical devices and machines (see maps 12 and 19). The development and market launch of products and methods is closely related with the existence of a close network of capital providers, specialized service firms and a potent support and technology transfer infrastructure (see maps 15 and 16). For example, the innovation center for therapeutic medical technology, ITEM GmbH, set up as medical technology consultant in 2003, prepares feasibility studies and provides consultation in all matters of development and filing of patents also for start ups. The public health system as such, i.e., the out-patient and in-patient care institutions, is not only a consumer of medical technology, pharmaceutical and biotechnological products, it also is instrumental to product development and clinical testing right to the level of product launch.

The conurbation of Munich provides best conditions for cooperation among the different actors in the health system and health industry (see map 19).

Companies, hospitals and clinics as well as university and non-university research institutions in Munich’s health system and industry maintain close relations among each other (see maps 18 and 19). Industry cooperates with the Technical University, first and foremost, in nutritional medicine and assists research, for example, by funding university chairs. The university hospitals of LMU and the hospital complex “Rechts der Isar”, which belong to the Technical University, maintain close ties with the medical departments of both universities. Many university teachers are involved in clinical research. Besides, students can get first-hand experience from work at the hospitals.
Munich – data hub and gateway

Today, modern means of communication transfer data and information to any place on the globe in a matter of seconds. The exchange of technical knowledge through the internet is growing; broadband and digital television open new possibilities. Munich is a leading data hub for electronic communication. To produce new knowledge requires direct contact among those who have it, also at this time of modern communication. An efficient hardware infrastructure is an absolute ‘must’ for increasing international, national and urban mobility.

Munich data hub

High-speed data lines and the smooth and uncomplicated provision of the telecommunication infrastructure are the basis of modern economic sites. The industrial area of Munich has several city loops and a large number of television transmission networks and urban links. Many carriers have settled in Munich, e.g., the municipal company M’net, providing the full range of telecommunication services such as telephone, broadband internet service and local area networks from a single source (see map 11).

Munich gateway

Munich’s importance as gateway city has grown with access to eastern Europe. Airport, railroad stations, the rail and road networks and the public commuting service are the physical basis for the transfer of people and goods (see map 20).

A high-capacity international airport became available with the construction of the new airport in 1992. Since business started, the number of flights and passengers went up constantly. From 12.7 million in 1993, the figure rose to well over 26.8 million passengers in 2004; the number of flights went up from 192,200 in 1993 to 383,100 in 2004. Looking at these figures, the present discussion about the construction of a third runway is understandable.

In the passenger statistics, Munich airport ranks second as passenger airport after Frankfurt am Main. Non-stop or direct flights from Munich go to almost all major international destinations outside Europe. Business passengers from Upper and Lower Bavaria and Swabia, even Salzburg and Tyrol, take flights from Munich. Munich airport is also a major driving force of economic development in Bavaria: over 23,000 people have jobs there. As the airport expands, about three jobs are created new every day.

Munich is also a central rail hub for goods and passengers. Long-distance and BayernTakt regional trains arrive at or leave from three terminal stations. Four Intercity long-distance lines are served by a train every hour between Munich, Stuttgart and Nuremberg. Trains also run from Munich to the neighboring countries.

Public commuter transport is served by the rapid transit system network, two lines serving the airport and high-level urban transport system, which take locals and visitors to their destinations quickly and safely.

Fig. 5: Take-offs and landings at Munich airport

Fig. 6: Passenger statistics of Munich airport

Source: www.munich-airport.de
Libraries in Munich

Municipal libraries
University and polytechnic libraries
Other libraries
Hospital libraries and libraries in old peoples' homes
Church libraries

Source: Overview map: 1:500,000, Bayer. Landesamt für Vermessung und Geoinformation, Nr. 1576/05
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Social Geography, Ludwig-Maximilians-University of Munich

Munich - City of Knowledge
Culture and art in the city of knowledge: places of inspiration

Places such as libraries, museums or theaters make meeting knowledge easy and people want to know more. They radiate a positive atmosphere and an open approach to knowledge as a resource. Munich is a city with an open and inspiring climate, an important precondition to attract creative people and make them want to stay.

Libraries in Munich

“The amount of information which everyone faces every day is growing. However, information which is not possible to get at is lost for ever. This is why we need libraries.”

These were the words with which the president of Ludwig-Maximilians-University in Munich, Prof. Dr. Bernd Huber, characterized the importance of a diversified library landscape for today’s knowledge society. There are about 700 libraries in Munich.

By making their stocks of books, periodicals, audio and video volumes and electronic publications available for the public and archiving them, libraries serve research and also provide the general public with literature and information.

To make knowledge available to the urban society of Munich is the task of the Munich City Library. With short of 30 branches in different parts of the city and the central library at Gasteig, it is at present the biggest municipal library association in all of Germany. Some 3.2 million books, periodicals and new media can be borrowed or read, viewed or listened to in the library rooms. Readings, talks and exhibitions in the branch libraries add to the cultural life in out-of-town Munich (see map 21). Hospitals, old peoples’ homes and church parishes also have sizable stocks of books (see map 21).

The Bavarian State Library is one of the biggest scientific libraries in the German-speaking area. It is also the central library of the Free State of Bavaria and the state’s authority in all matters concerning the Bavarian library system. Founded by duke Herzog Albrecht V as Wittelsbach court library in 1558, it now has over eight million volumes and an outstanding stock of old books with choice specimens from the early times of book printing as well as numerous special collections such as valuable maps, bequests, portraits and painters’ books and one of the world’s most outstanding collections of autographs. With at present over 40,000 periodicals and newspapers, the Bavarian State Library is the second-biggest periodicals Library in Europe, after the British Library in London (see map 21).

The University Library of Munich (with about 6.5 million volumes), the Library of the Technical University (with about 1.9 million volumes), the Library of the University of Applied Sciences (270,000 media and 700 periodicals) cater for scientific research and the training of students; libraries in other institutions, such as the Deutsche Museum (over 850,000 volumes) or the German Patent and Trade Mark Office (over 9000,000 volumes) are also important stocking places of knowledge (see map 21).
Museums and exhibition centers in Munich

Museums transmit knowledge by collecting, treating, cataloging and exhibiting interesting objects from history, technology and art.

Munich, with its large number and variety of exhibition centers, is an important city of museums of international standing. About 4.4 million people visited museums in Munich in 2003 informed themselves of different fields of knowledge and were inspired by works of art.

Munich has museums focusing on natural science and scientific and technological areas; others concentrate on history, including cultural history. Museums of art are a major category (see map 22). Important museums of art include the Alte Pinakothek with master works of European painting from the 14th through 18th centuries and the Neue Pinakothek showing European art from classicist to Art Nouveau styles. By opening the third Pinakothek – the Pinakothek der Moderne – in the fall of 2002, Munich added further to its array of outstanding art collec-

The Deutsche Museum with an exhibition area of 55,000 sq.m. is one of the biggest and best known museums of technology and natural sciences in the world. It was founded by Oskar von Miller in 1903. Visitors can see some 18,000 historical and rebuilt apparatuses, machines, models and test setups from many different technical fields. In addition to the big museums, there are small and sometimes highly dedicated exhibitions such as the Kartoffelmuseum or the Valentin "Musäum" (museum in vernacular) dedicated to Karl Valentin, Munich actor and author of plays, cabaret songs and comic scenes, and his partner of many years, Liesl Karlstadt.

The varied museum landscape is financed primarily by the Free State of Bavaria or State-run institutions and by foundations. The Bavarian capital also has many municipal museums: the Münchner Stadtmuseum (Munich Municipal Museum), the Villa Stuck, the Lenbachhaus, and the Münchner Jüdisches Museum (Jewish Museum).

Munich’s museums organize a special highlight every year: In the ‘Long Night of Museums’ all museums in town are open to visitors until 2 o’clock next morning and entry is possible only with a single ticket. An extra program of music, dance and staged plays complements the night-time event.

Munich’s museums organize a special highlight every year: In the ‘Long Night of Museums’ all museums in town are open to visitors until 2 o’clock next morning and entry is possible only with a single ticket. An extra program of music, dance and staged plays complements the night-time event.
Theaters and music performance centers in Munich

Source: Overview map: 1:500,000; Bayer Landesamt für Vermessung und Geoinformation, Nr. 15/16/05
Vermessungsamt der Landeshauptstadt München
Survey and mapping: Institute of Socil Geography, Ludwig-Maximilians-University of Munich
Theater in Munich means culture at high level, whether in representative places or an alternative cellar theater. At one place, a world famous conductor and outstanding singers give demonstrations of their skills, at others experimental plays are staged. In addition to providing entertainment, the theater also transmits high culture, literary texts and subjects critical of society. In this way, theaters stage cultural knowledge.

With some 100 theaters and places at which music is performed, the theater landscape of Munich is both historical and diverse: Whereas the Residenztheater, the Nationaltheater and the Cuvilliés-Theater on Maximilianstraße were set up as court theaters as early as in the 18th century, the second half of the 19th century, on bourgeois initiative, saw the emergence of the Theater am Gärtnerplatz, the Prinzregententheater in Bogenhausen and the Kammerspiele (chamber theater) in downtown Munich (see map 23). At the same time, artists’ pubs sprang up, in which artists and writers such as Karl Valentin, Liesl Karstadt or Bertolt Brecht staged stories and plays, some of them went down in theater history.

Munich also has numerous small private theaters, set up during the protest movement in 1968. A large number of amateur theaters in pubs, civic centers, societies and parish halls, enrich the cultural life in the city and contribute to the cultural identity of the people. Theaters for children and youth also have a home in Munich: the "Schauburg – Theater der Jugend" on Elisabethplatz is one of the best-known children and youth theater in Germany. Vicious political satire shows, for example the Lach- und Schiessgesellschaft or in Heppel & Ettlich, are part and parcel of Munich’s theater culture (see map 23).

In recent years, the local theater landscape has seen efforts to take up topics cutting across theater borders. For example, in October 1998 the Metropol Theater started its creative theater work under a non-profit making company, staging film adaptations on the music and spoken theater stages in the north of Munich, an area of little cultural development.

Theater in Munich is also staged outdoors. In the warm season, many outdoor stages in parks attract many people. During that time, the city turns into a stage: Theaters find their audiences between Shakespeare and the picnic basket.

Locals and their guests can enjoy a special theater highlight since this summer: The Olympic Stadium is no longer the venue of “King Soccer”. It is now the scene of gigantic stagings of opera shows such as Giacomo Puccini’s Turandot with fireworks and a fascinating light show outdoors.

Besides, the “Opera for Everyone” has become a synonym of the Munich opera festival. The Bavarian state opera transmits a major performance of the festival live from the National Theater to a large video wall on Max Joseph Platz. The free ‘Opera for Everyone’ is a present to the local people in return of the support it extends to the Bavarian State Opera throughout the year.
Strategies for Munich as a City of Knowledge

This follow-up of the stocktaking study shows the impressive diversity, density and quality of knowledge-based institutions in Munich. This outstanding level of the city is the outcome of numerous individual initiatives and of prospective actors and supporters of science. However, Munich should not rest on its laurels. Because, in the meantime, many other cities have recognized the great importance of knowledge as a resource of their further development. So Munich requires an explicit strategy and plan of action to maintain its top position as city of knowledge. This strategy should fathom and identify all possible activities it can undertake and where accompanying measures by other actors, most of all the state government or the federal government, are needed and desirable.

Strategic fields of activity

In a current European comparative study by the university of Rotterdam looking at the strategic fields of action of cities of knowledge, in which Munich participated, seven factors were identified as defining the basis of a city of knowledge. These are:

- Quality of life
- Knowledge base
- Economic base
- Urban Scale
- Social Equity
- Accessibility
- Urban diversity

With its vast number of knowledge-based institutions and a sound economic basis, Munich's position is excellent, both nationally and internationally. In terms of quality of life, this city is among those on top in the world by international comparison. As core city in an agglomeration with over 2.3 million inhabitants, Munich has the required urban size for quick and versatile turnover of knowledge. With airport, long-distance railroads and motorway links, Munich is a major traffic hub in Germany. Social conditions have become harsher in Munich also in connection with the rising national unemployment statistics. Despite that, the city has the lowest unemployment rate of all big German cities. The so called subculture scene in Munich is of a type different than that, say, of Berlin mainly due to the lack of cheap studio locations, but due to the high concentration of cultural institutions run by the municipality or the state, Munich is known as a city of culture. Generally, all basic factors must be interlinked with each other. They can be improved in the medium and long-term by an integrated urban development policy, whose basis is the "Munich Perspektiv" concept. Under this concept, the Department of Labor and Economic Development will prepare a "City of Knowledge" guideline document.

In line with the results of the comparative study, Munich's potentials for further development as city of knowledge are in the following strategic fields of action:

Bring new knowledge and new ideas into the city

Strengthening the science location is a general task for Munich as a whole. First and foremost, the conditions provided for the generation of new knowledge should be as good as possible. For this, it is important that the available research institutions thrive in an agreeable environment, the settlement of new

Olympic Park
establishments should be encouraged as far as possible. Of course, a city of knowledge should provide more than just the general conditions for traditional research and knowledge available for industrial exploitation. The full range of knowledge-based institutions in a broader sense must be in focus. This also includes institutions with access to large sections of the population, such as museums, libraries and theaters, which are abundant in Munich.

**Intensify the application and translation of knowledge**
The transfer of knowledge must be supported. This means that the cooperation of science and industry must be advanced. Not all research results that would be eligible really take all the hurdles from invention to innovation, i.e., that they are translated into marketable products. So the target is to maintain a wide innovative production basis in Munich. Only by the interaction of the translation of research findings in the production process and the feedback of results of practical application can innovation be sustainable.

**Support growth industries**
Support must be directed to growth sectors because innovation policy is always also economic and location policy. This is the only way to maintain an attractive pool of high-quality jobs whose high value-added content is a precondition for production at any cost-intensive conurbation. The Munich technology center and the provision of industrial land is a purposeful approach which Munich takes in this respect.

**Attract knowledge-workers**
The city and region must be attractive to researchers, entrepreneurs, generally to talented people and creative minds. Because not only the infrastructure is important for a city of knowledge, the people working in it are a decisive factor. A strong and diversified knowledge-based workforce makes Munich attractive for companies and research institutions.

**Use the organizational capacity of the municipality**
It is also important to make all relevant actors in the city share in common projects. Because knowledge society is a network society, this needs more intensive networking in key technologies across branch-specific and organizational borders in companies and scientific research. Knowledge and innovation are generated increasingly on the fringes of individual research realms. Only by networking can so called spill overs of knowledge be utilized more meaningfully. The city and the state, science and industry must work together intensively as a regional network.
Action plan for the future development of Munich as a City of Knowledge

The city is already active in all strategic fields. Despite this, it is important to follow up these fields with a focal approach in which the large research institutions, universities and colleges, in addition to the city and the Free State of Bavaria, are major actors, primarily in the framework of the government’s university policy and support of high-tech clusters. Viewed from the angle of the Department of Labor and Economic Development, the city should give priority to the following activities:

To **strengthen the knowledge basis**, knowledge should be transmitted at a broad front and the desire for knowledge encouraged already at preschool age and at school, to introduce children and youth to the sciences in a manner appropriate to their age and in this way create a basis for vocational qualification and life-long learning early in life. This is the task of the city as the entity responsible for schooling as well as for universities and research institutions, for which it should open itself to joint projects involving children and other young people. The activities organized by the children’s university are promising in this respect. University professors present scientific topics so that children can understand them. Also worth a mention in this context is the “school and science” network which is being set up on the initiative of the department of schools with the aim to give school classes a hands-on experience of scientific institutes and laboratories in Munich. Strengthening the knowledge base is also the task of adult education traditionally at home in the local college for adult education, the largest of its kind in Germany.

Only occasionally can a city support the generation of new knowledge. It can advance future-oriented technologies mainly by internal innovative projects, such as the introduction of open source for municipal computers. In addition, the city can accompany the **application of knowledge** across the full chain of utilization. For example, in the field of patent, which is so important in Munich, it can assist potential founders in patent realization and matters of industrial property right. Through its consultation offices, the city, in addition to assisting business founders and researchers in the sale of patents, can also recommend alternatives, such as setting up new firms, and faster such processes. Technology centers provide founders with suitable and variable space at reasonable terms to advance economic exploitation of new business concepts mainly in the initial years. This enables potential founders to realize their own patents and advance their industrial application as patent, license, own brand or by sale or outsource.

To **support growth industries**, which implies to get young and innovative firms to settle in the region as driving forces of regional economic development and to assist the development of companies established on site. The available tools, viz. technology and founder centers, business plan competition, business founder loans, and coaching programs, should be extended further. The development and application of new technologies and services should be encouraged. This also includes the provision of suitable industrial land to companies at different phases of their development.

The competition for creative people among municipalities will become much harsher in view of the demographic development. Therefore, it is important to **win and hold talented people**. The universities and colleges throw their courses open to international enrollment and try to win more foreign guest students. The city should emphasize and maintain its role as a university center more than it did in the past, also in view of the fact that the state has sited several university institutes outside the city boundaries. A positive approach taken by the city is the institution of university awards to students for outstanding work on topics relating to Munich. Besides, the city should give more attention to students as a group of the municipal population.

To **strengthen the organizational capacity of the region** is another task, also of the city. As many actors from industry, science, politics and society as possible should be integrated in regional networks supporting knowledge as a resource. The basis of such a network could be an internet platform. On the other hand, the close neighborhood of the different actors in the city and the region facilitates the exchange of ideas and the development of new approaches. The city as a local partner can create a suitable environment in which regional cooperation can flourish. A concrete starting point is the “Science and Economy” working party initiated and managed by the city’s Department of Labor and Economic Development, which is a clearing house of new ideas among the city, universities, colleges and industry-related institutions to make the city of knowledge known to a wider public.
Notes on the study

The aim of this study is twofold:
• to list and map knowledge-intensive and technology-oriented companies and institutions in the city and region of Munich;
• to get detailed information about the research and development (R&D) activities of big companies in the city and region of Munich.

This booklet is a follow-up of the study 'Munich – City of Knowledge' published in 2002 and updates the results of that study.

For this study, the Institute of Social Geography of the Ludwig-Maximilians-University of Munich collected and geocoded a total of about 3,500 addresses within planning region 14 (state capital of Munich and the districts of Dachau, Ebersberg, Erding, Freising, Fürstenfeldbruck, Landsberg am Lech, Munich and Starnberg) from various lists of companies and institutions (see list of sources) during the first half-year of 2005.

The R&D activities of the big companies were inquired by a telephone poll in the spring of 2005. Based on the Hoppenstedt corporate database, all big companies with more than 500 employees in planning region 14 were identified. In contrast with the benchmark study, this study focuses on the specific conditions and structures of R&D activities in big companies. A total of 281 companies was contacted by telephone. Of these, 54 companies refused participation, bringing the total number of companies responding to our queries to 227. There were 113 companies with R&D activities and 114 companies without.

The following questions were asked on the telephone:
• Industry, year of formation and principal place of business of the company,
• Number of social contribution paying employees worldwide and in Munich,
• Number of social contribution paying employees in R&D worldwide and in Munich,
• Cooperation of the companies with R&D activities with universities, colleges and other public research establishments and other companies in the Munich region,
• Location of the principal R&D cooperation partner.

Sites of knowledge in Munich: selected addresses

Companies with research and development activities
The following companies took part in the survey of the Institute of Social Geography of the Ludwig-Maximilians-University of Munich and stated that they have R&D activities.

Manufacturing sector

<table>
<thead>
<tr>
<th>Company</th>
<th>Street</th>
<th>ZIP</th>
<th>City/town</th>
<th>Internet address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkor GmbH Kunststoffe</td>
<td>Morgenstr. 9</td>
<td>81479</td>
<td>München</td>
<td><a href="http://www.alkor.de">www.alkor.de</a></td>
</tr>
<tr>
<td>Alkor-Venilia GmbH</td>
<td>Am Haag 8</td>
<td>82166</td>
<td>Gräfelfing</td>
<td><a href="http://www.alkor-venilia.com">www.alkor-venilia.com</a></td>
</tr>
<tr>
<td>ARD- Erstes Deutsches Fernsehen</td>
<td>Arnulfstr. 42</td>
<td>80335</td>
<td>München</td>
<td><a href="http://www.ard.de">www.ard.de</a></td>
</tr>
<tr>
<td>ARRI Arnold &amp; Richter Cine Technik Betriebs GmbH &amp; Co KG</td>
<td>Türkenstr. 89</td>
<td>80799</td>
<td>München</td>
<td><a href="http://www.arri.de">www.arri.de</a></td>
</tr>
<tr>
<td>Autoliv GmbH Werk Süd</td>
<td>Theodor-Heuss-Str. 2</td>
<td>85221</td>
<td>Dachau</td>
<td><a href="http://www.autoliv.de">www.autoliv.de</a></td>
</tr>
<tr>
<td>Avon Cosmetics GmbH</td>
<td>Am Hart 2</td>
<td>85375</td>
<td>Neufahrn</td>
<td><a href="http://www.avon.de">www.avon.de</a></td>
</tr>
<tr>
<td>Balfour Beatty Rail GmbH</td>
<td>Garmischer Str. 35</td>
<td>81377</td>
<td>München</td>
<td><a href="http://www.bbrail.com">www.bbrail.com</a></td>
</tr>
<tr>
<td>Bayerischer Rundfunk</td>
<td>Rundfunkplatz 1</td>
<td>80335</td>
<td>München</td>
<td><a href="http://www.br-online.de">www.br-online.de</a></td>
</tr>
<tr>
<td>BEA Systems GmbH</td>
<td>Einsteinring 35</td>
<td>85609</td>
<td>Aschheim</td>
<td><a href="http://www.bea.com">www.bea.com</a></td>
</tr>
<tr>
<td>BMW AG</td>
<td>Petuelring 130</td>
<td>80809</td>
<td>München</td>
<td><a href="http://www.bmwgroup.com">www.bmwgroup.com</a></td>
</tr>
<tr>
<td>Brain Force Software GmbH</td>
<td>Carl-von-Linde-Str. 38</td>
<td>85716</td>
<td>Unterschleißheim</td>
<td><a href="http://www.brainforce.com">www.brainforce.com</a></td>
</tr>
<tr>
<td>Bristol-Myers Squibb GmbH &amp; KGaA</td>
<td>Saporrobo gen 6</td>
<td>80637</td>
<td>München</td>
<td><a href="http://www.b-">www.b-</a> ms.de</td>
</tr>
<tr>
<td>BRUNATA WÄRMEMESSER GmbH &amp; Co. KG</td>
<td>Aidenbachstr. 40</td>
<td>81379</td>
<td>München</td>
<td><a href="http://www.brunata-muenchen.de">www.brunata-muenchen.de</a></td>
</tr>
<tr>
<td>BSH Bosch und Siemens Hausgeräte GmbH</td>
<td>Carl-Wery-Str. 34</td>
<td>81739</td>
<td>München</td>
<td><a href="http://www.bsh-group.de">www.bsh-group.de</a></td>
</tr>
<tr>
<td>Company</td>
<td>Street</td>
<td>ZIP</td>
<td>City/town</td>
<td>Internet address</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------------------</td>
<td>--------</td>
<td>-----------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Burger King GmbH</td>
<td>Peschelanger 3</td>
<td>81735</td>
<td>München</td>
<td><a href="http://www.burgerking.de">www.burgerking.de</a></td>
</tr>
<tr>
<td>Computacenter Holding GmbH</td>
<td>Hörselbergstr. 7</td>
<td>81677</td>
<td>München</td>
<td><a href="http://www.computacenter.de">www.computacenter.de</a></td>
</tr>
<tr>
<td>Convatec Vertriebs-GmbH</td>
<td>Saporobogen 6</td>
<td>80909</td>
<td>München</td>
<td><a href="http://www.convatec.com">www.convatec.com</a></td>
</tr>
<tr>
<td>dba Luftfahrtgesellschaft mbH</td>
<td>Wartungsallee 13</td>
<td>89356</td>
<td>Freising</td>
<td><a href="http://www.flydza.com">www.flydza.com</a></td>
</tr>
<tr>
<td>Deutsche DOKA Schaltungstechnik GmbH</td>
<td>Frauenstr. 35</td>
<td>82216</td>
<td>Maisach</td>
<td><a href="http://www.doka.com">www.doka.com</a></td>
</tr>
<tr>
<td>DYWIDAG-Systems International GmbH</td>
<td>Dywidagstr. 1</td>
<td>85609</td>
<td>Aschheim</td>
<td><a href="http://www.dywidag-systems.com">www.dywidag-systems.com</a></td>
</tr>
<tr>
<td>EADS Astrum GmbH</td>
<td>Ludwig-Bölkow-Allee</td>
<td>85521</td>
<td>Ottobrunn</td>
<td><a href="http://www.astrum.eads.net">www.astrum.eads.net</a></td>
</tr>
<tr>
<td>EM.TV AG</td>
<td>Beta-Str. 11</td>
<td>85774</td>
<td>Unterföhring</td>
<td><a href="http://www.em.tv">www.em.tv</a></td>
</tr>
<tr>
<td>Essex Pharma GmbH</td>
<td>Thomas-Dehler-Str. 27</td>
<td>81737</td>
<td>München</td>
<td><a href="http://www.essex.de">www.essex.de</a></td>
</tr>
<tr>
<td>FX. Meiller Fahrzeug- u. Maschinenfabrik Gmbh &amp; Co KG</td>
<td>Untermenzinger Str. 1</td>
<td>80997</td>
<td>München</td>
<td><a href="http://www.fiji.com">www.fiji.com</a></td>
</tr>
<tr>
<td>FJI AG</td>
<td>Leonhard-Moll-Bogen 10</td>
<td>81373</td>
<td>München</td>
<td><a href="http://www.fiji.de">www.fiji.de</a></td>
</tr>
<tr>
<td>Fujisawa Deutschland GmbH</td>
<td>Berg-am-Laim-Str. 129</td>
<td>81673</td>
<td>München</td>
<td><a href="http://www.fujisawa-deutschland.de">www.fujisawa-deutschland.de</a></td>
</tr>
<tr>
<td>Georg Fritzmeier - GmbH &amp; Co. KG</td>
<td>Förstr. 2</td>
<td>85655</td>
<td>Großhelfendorf</td>
<td><a href="http://www.fritzmeier.de">www.fritzmeier.de</a></td>
</tr>
<tr>
<td>Giesecke &amp; Devrient GmbH</td>
<td>Prinzregentenstr. 159</td>
<td>81677</td>
<td>München</td>
<td><a href="http://www.gi.de">www.gi.de</a></td>
</tr>
<tr>
<td>GlaxoSmithKline GmbH &amp; Co. KG</td>
<td>Theresienhöfe 11</td>
<td>80339</td>
<td>München</td>
<td><a href="http://www.glaxosmithkline.de">www.glaxosmithkline.de</a></td>
</tr>
<tr>
<td>HAWE Hydraulik GmbH &amp; Co. KG</td>
<td>Streifeldstr. 25</td>
<td>81673</td>
<td>München</td>
<td><a href="http://www.hawe.de">www.hawe.de</a></td>
</tr>
<tr>
<td>Heine Optotechnik GmbH &amp; Co. KG</td>
<td>Kientalstr. 7</td>
<td>82211</td>
<td>Herrsching</td>
<td><a href="http://www.heine.com">www.heine.com</a></td>
</tr>
<tr>
<td>Hilti Deutschland GmbH</td>
<td>Hiltistr. 2</td>
<td>86916</td>
<td>Kaufering</td>
<td><a href="http://www.hilti.de">www.hilti.de</a></td>
</tr>
<tr>
<td>Hirschkogel Umformtechnik GmbH</td>
<td>Mühlerstr. 6</td>
<td>86920</td>
<td>Denklingen</td>
<td><a href="http://www.hirschkogel.com">www.hirschkogel.com</a></td>
</tr>
<tr>
<td>Hoffmann GmbH</td>
<td>Haberlandstr. 55</td>
<td>81241</td>
<td>München</td>
<td><a href="http://www.hoffmann-group.com">www.hoffmann-group.com</a></td>
</tr>
<tr>
<td>Hubert Burda Media Holding GmbH &amp; Co. Kg</td>
<td>Arabellstr. 23</td>
<td>81925</td>
<td>München</td>
<td><a href="http://www.burda.de">www.burda.de</a></td>
</tr>
<tr>
<td>Infineon Technologies AG</td>
<td>St.-Martin-Str. 53</td>
<td>81669</td>
<td>München</td>
<td><a href="http://www.infineon.com">www.infineon.com</a></td>
</tr>
<tr>
<td>Informatik-Zentrum Bayern</td>
<td>Richard Reizner Allee 8</td>
<td>85540</td>
<td>Haar</td>
<td><a href="http://www.izb-soft.de">www.izb-soft.de</a></td>
</tr>
<tr>
<td>IVM Automotive Holding GmbH &amp; Co. KG</td>
<td>Hufelandstr. 13</td>
<td>80939</td>
<td>München</td>
<td><a href="http://www.irm-automotive.com">www.irm-automotive.com</a></td>
</tr>
<tr>
<td>ivis Ketten</td>
<td>Albert-Roßhaupter-Str. 53</td>
<td>81369</td>
<td>München</td>
<td><a href="http://www.ivis.com">www.ivis.com</a></td>
</tr>
<tr>
<td>Jungheinrich Aktiengesellschaft</td>
<td>Mittenheimer Straße 56</td>
<td>85764</td>
<td>Oberschleißheim</td>
<td><a href="http://www.jungheinrich.de">www.jungheinrich.de</a></td>
</tr>
<tr>
<td>Kabel Deutschland GmbH</td>
<td>Beta-Str. 6</td>
<td>85774</td>
<td>Unterföhring</td>
<td><a href="http://www.kabeldeutschland.de">www.kabeldeutschland.de</a></td>
</tr>
<tr>
<td>Knorr-Bremse AG</td>
<td>Moosacher Str. 80</td>
<td>80809</td>
<td>München</td>
<td><a href="http://www.knorr-bremse.de">www.knorr-bremse.de</a></td>
</tr>
<tr>
<td>Kontron AG</td>
<td>Oskar-von-Miller-Str. 1</td>
<td>85386</td>
<td>Eching</td>
<td><a href="http://www.kontron.de">www.kontron.de</a></td>
</tr>
<tr>
<td>Kufner Textilwerke GmbH</td>
<td>Ischenhausenstr. 10</td>
<td>81379</td>
<td>München</td>
<td><a href="http://www.kufner-textil.com">www.kufner-textil.com</a></td>
</tr>
<tr>
<td>Lutz Fleischwaren AG</td>
<td>Justus v. Liebig Str. 48</td>
<td>86899</td>
<td>Landsberg/Lech</td>
<td><a href="http://www.lutz-fleischwaren.de">www.lutz-fleischwaren.de</a></td>
</tr>
<tr>
<td>MAN AG</td>
<td>Ungererstr. 69</td>
<td>80805</td>
<td>München</td>
<td><a href="http://www.man.de">www.man.de</a></td>
</tr>
<tr>
<td>Mc Donald's Deutschland Inc.</td>
<td>Drygalski-Allee 51</td>
<td>81477</td>
<td>München</td>
<td><a href="http://www.mcdonalds.de">www.mcdonalds.de</a></td>
</tr>
<tr>
<td>Michael Huber Munich GmbH</td>
<td>Feldkirchener Str. 15</td>
<td>85551</td>
<td>Kirchheim</td>
<td><a href="http://www.mhm.de">www.mhm.de</a></td>
</tr>
<tr>
<td>Microsoft Deutschland GmbH</td>
<td>Konrad-Zuse-Str. 1</td>
<td>85716</td>
<td>Unterschleißheim</td>
<td><a href="http://www.microsoft.com">www.microsoft.com</a></td>
</tr>
<tr>
<td>MRF Michael Rosenthal GmbH</td>
<td>Freisinger Str. 1</td>
<td>85716</td>
<td>Unterschleißheim</td>
<td><a href="http://www.rovers.com">www.rovers.com</a></td>
</tr>
<tr>
<td>msg systems AG</td>
<td>Robert-Bürkle-Str. 1</td>
<td>85737</td>
<td>Ismaning</td>
<td><a href="http://www.msg.de">www.msg.de</a></td>
</tr>
<tr>
<td>MTU Aero Engines GmbH</td>
<td>Dachauer Str. 665</td>
<td>80995</td>
<td>München</td>
<td><a href="http://www.mtu.de">www.mtu.de</a></td>
</tr>
<tr>
<td>O2 (Germany) GmbH &amp; Co. OHG</td>
<td>Georg-Brauchle-Ring 23</td>
<td>80992</td>
<td>München</td>
<td><a href="http://www.o2online.de">www.o2online.de</a></td>
</tr>
<tr>
<td>Oce Printing Systems GmbH</td>
<td>Siemensaile 2</td>
<td>85586</td>
<td>Poing</td>
<td><a href="http://www.oce.com">www.oce.com</a></td>
</tr>
<tr>
<td>Optische Werke G. Rodenstock</td>
<td>Isartalstr. 39</td>
<td>80469</td>
<td>München</td>
<td><a href="http://www.rodenstock.de">www.rodenstock.de</a></td>
</tr>
<tr>
<td>Osram GmbH</td>
<td>Hellabrunner Str. 1</td>
<td>81543</td>
<td>München</td>
<td><a href="http://www.osram.de">www.osram.de</a></td>
</tr>
<tr>
<td>Parametric Technology GmbH</td>
<td>Edisonstr. 8</td>
<td>85716</td>
<td>Unterschleißheim</td>
<td><a href="http://www.pct.com">www.pct.com</a></td>
</tr>
<tr>
<td>Paulaner Brauerei GmbH &amp; Co. KG</td>
<td>Hochstr. 75</td>
<td>81541</td>
<td>München</td>
<td><a href="http://www.paulaner.de">www.paulaner.de</a></td>
</tr>
<tr>
<td>Philip Morris GmbH</td>
<td>Fallstr. 40</td>
<td>81369</td>
<td>München</td>
<td><a href="http://www.philipmorrisinternational.com">www.philipmorrisinternational.com</a></td>
</tr>
<tr>
<td>RATIONAL Aktiengesellschaft</td>
<td>Iglinger Str. 62</td>
<td>86899</td>
<td>Landsberg/Lech</td>
<td><a href="http://www.rational-ag.de">www.rational-ag.de</a></td>
</tr>
<tr>
<td>Refratechnik Holding GmbH</td>
<td>Adalpstr. 22</td>
<td>85737</td>
<td>Ismaning</td>
<td><a href="http://www.refratechnik.com">www.refratechnik.com</a></td>
</tr>
<tr>
<td>Rohde &amp; Schwarz GmbH &amp; Co. KG</td>
<td>Mühldorfstr. 15</td>
<td>81671</td>
<td>München</td>
<td><a href="http://www.rohde-schwarz.com">www.rohde-schwarz.com</a></td>
</tr>
<tr>
<td>Sandoz Pharmaceuticals GmbH</td>
<td>Carl-Zeiss-Ring 3</td>
<td>85737</td>
<td>Ismaning</td>
<td><a href="http://www.sandoz.de">www.sandoz.de</a></td>
</tr>
<tr>
<td>Sankey Pharma GmbH</td>
<td>Zielstrassl 9</td>
<td>81379</td>
<td>München</td>
<td><a href="http://www.sankyo-pharma.de">www.sankyo-pharma.de</a></td>
</tr>
<tr>
<td>Schaltbau Holding AG</td>
<td>Klausenburger Str. 6</td>
<td>81677</td>
<td>München</td>
<td><a href="http://www.schaltbau.de">www.schaltbau.de</a></td>
</tr>
<tr>
<td>Schiedel GmbH &amp; Co.</td>
<td>Lcherenstr. 9</td>
<td>80995</td>
<td>München</td>
<td><a href="http://www.schiedel.de">www.schiedel.de</a></td>
</tr>
<tr>
<td>SCHWENK Dämmtechnik GmbH &amp; Co. KG</td>
<td>Isotex-Str. 1</td>
<td>86899</td>
<td>Landsberg/Lech</td>
<td><a href="http://www.schwank.de">www.schwank.de</a></td>
</tr>
<tr>
<td>sd&amp;m software design &amp; management AG</td>
<td>Carl-Wery-Str. 42</td>
<td>81739</td>
<td>München</td>
<td><a href="http://www.sd&amp;m.de">www.sd&amp;m.de</a></td>
</tr>
<tr>
<td>Serena Software Germany GmbH</td>
<td>Oskar-Messter-Str. 33</td>
<td>85737</td>
<td>Ismaning</td>
<td><a href="http://www.serena.com">www.serena.com</a></td>
</tr>
<tr>
<td>SHS Informationssysteme GmbH</td>
<td>Leopoldstr. 230</td>
<td>80804</td>
<td>München</td>
<td><a href="http://www.shs.de">www.shs.de</a></td>
</tr>
<tr>
<td>Siemens AG</td>
<td>Wittelsbacherplatz 2</td>
<td>80333</td>
<td>München</td>
<td><a href="http://www.siemens.de">www.siemens.de</a></td>
</tr>
<tr>
<td>Siemens Building Technologies Fire &amp; Security Products OHG</td>
<td>Richard-Strauss-Str. 76</td>
<td>81879</td>
<td>München</td>
<td><a href="http://www.sbt.siemens.de">www.sbt.siemens.de</a></td>
</tr>
<tr>
<td>Siltronic AG</td>
<td>Hanns-Seidel-Platz 4</td>
<td>81737</td>
<td>München</td>
<td><a href="http://www.siltronic.com">www.siltronic.com</a></td>
</tr>
<tr>
<td>softlab GmbH</td>
<td>Zamdorfer Str. 120</td>
<td>81677</td>
<td>München</td>
<td><a href="http://www.softlab.de">www.softlab.de</a></td>
</tr>
<tr>
<td>Spinnner GmbH Elektrotechnische Fabrik</td>
<td>ErziehBereistr. 33</td>
<td>80335</td>
<td>München</td>
<td><a href="http://www.spinnder.de">www.spinnder.de</a></td>
</tr>
<tr>
<td>Steico AG</td>
<td>Hans-Friedl-Str. 21</td>
<td>85622</td>
<td>Feldkirchen</td>
<td><a href="http://www.steico.de">www.steico.de</a></td>
</tr>
<tr>
<td>Südcemie AG</td>
<td>Lenbachplatz 6</td>
<td>80333</td>
<td>München</td>
<td><a href="http://www.sud-cemie.com">www.sud-cemie.com</a></td>
</tr>
<tr>
<td>Südfleisch GmbH</td>
<td>Zennritzplatz 1</td>
<td>80337</td>
<td>München</td>
<td><a href="http://www.suedfleisch.de">www.suedfleisch.de</a></td>
</tr>
<tr>
<td>Sun Microsystems GmbH</td>
<td>Sonnenallee 1</td>
<td>85551</td>
<td>Kirchheim</td>
<td><a href="http://www.sun.com">www.sun.com</a></td>
</tr>
<tr>
<td>Süß Micro Tec AG</td>
<td>Schleißheimer Str. 90</td>
<td>85748</td>
<td>Garching</td>
<td><a href="http://www.suss.com">www.suss.com</a></td>
</tr>
<tr>
<td>SV-Druckzentrum Steinhäuser GmbH &amp; Co. KG</td>
<td>Zamdorfer Str. 40</td>
<td>81677</td>
<td>München</td>
<td><a href="http://www.sv-druckzentrum.de">www.sv-druckzentrum.de</a></td>
</tr>
</tbody>
</table>
### Company

<table>
<thead>
<tr>
<th>Company</th>
<th>Street</th>
<th>ZIP</th>
<th>City/town</th>
<th>Internet address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas Instruments Deutschland GmbH</td>
<td>Haggertystr. 1</td>
<td>85356</td>
<td>Freising</td>
<td><a href="http://www.ti.com">www.ti.com</a></td>
</tr>
<tr>
<td>ThyssenKrupp Präzisionsschmiede GmbH</td>
<td>Frankfurter Ring 227</td>
<td>80807</td>
<td>München</td>
<td><a href="http://www.thyssenkrupp.de">www.thyssenkrupp.de</a></td>
</tr>
<tr>
<td>Triumph International AG</td>
<td>Marsstr. 40</td>
<td>80355</td>
<td>München</td>
<td><a href="http://www.triumph.com">www.triumph.com</a></td>
</tr>
<tr>
<td>Vinnolit GmbH &amp; Co. KG</td>
<td>Carl-Zeiss-Ring 25</td>
<td>85737</td>
<td>Ismaning</td>
<td><a href="http://www.vinnolit.de">www.vinnolit.de</a></td>
</tr>
<tr>
<td>Volks Consulting Engineers GmbH &amp; Co. Planungs KG</td>
<td>Schleißheimer Str. 377</td>
<td>80935</td>
<td>München</td>
<td><a href="http://www.volke-muc.de">www.volke-muc.de</a></td>
</tr>
<tr>
<td>W.E.T. Automotive Systems AG</td>
<td>Rudolf-Diesel-Str. 12</td>
<td>85235</td>
<td>Odelzhausen</td>
<td><a href="http://www.wet.de">www.wet.de</a></td>
</tr>
<tr>
<td>Wacker Construction Equipment AG</td>
<td>Preußenstr. 41</td>
<td>80809</td>
<td>München</td>
<td><a href="http://www.wackergroup.com">www.wackergroup.com</a></td>
</tr>
<tr>
<td>Wacker-Chemie GmbH</td>
<td>Hanns-Seidel-Platz 4</td>
<td>81737</td>
<td>München</td>
<td><a href="http://www.wacker.com">www.wacker.com</a></td>
</tr>
<tr>
<td>Walter-Heilit Verkehrsewegebau GmbH</td>
<td>Klausenburger Str. 9</td>
<td>81677</td>
<td>München</td>
<td><a href="http://www.walter-heilit-vwb.de">www.walter-heilit-vwb.de</a></td>
</tr>
<tr>
<td>Webasto AG</td>
<td>Krallinger Str. 5</td>
<td>92131</td>
<td>Stockdorf</td>
<td><a href="http://www.webasto.de">www.webasto.de</a></td>
</tr>
<tr>
<td>Willy Bogner GmbH &amp; Co.</td>
<td>St.-Veit-Str. 4</td>
<td>81673</td>
<td>München</td>
<td><a href="http://www.bogner.com">www.bogner.com</a></td>
</tr>
</tbody>
</table>

## Services sector

### Company

<table>
<thead>
<tr>
<th>Company</th>
<th>Street</th>
<th>ZIP</th>
<th>City/town</th>
<th>Internet address</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAL Allgemeine Autoleasing GmbH</td>
<td>Tölzer Str. 15</td>
<td>82031</td>
<td>Grünwald</td>
<td><a href="http://www.allianz.de">www.allianz.de</a></td>
</tr>
<tr>
<td>Allianz AG</td>
<td>Königstr. 28</td>
<td>80802</td>
<td>München</td>
<td><a href="http://www.allianz.de">www.allianz.de</a></td>
</tr>
<tr>
<td>Augustinum gemeinnützige GmbH</td>
<td>Stiftsbg. 74</td>
<td>81375</td>
<td>München</td>
<td><a href="http://www.augustinum.de">www.augustinum.de</a></td>
</tr>
<tr>
<td>Bayerische Hypo- und Vereinsbank AG</td>
<td>Am Tucherpark 16</td>
<td>80538</td>
<td>München</td>
<td><a href="http://www.hypovereinsbank.de">www.hypovereinsbank.de</a></td>
</tr>
<tr>
<td>Bayern LB</td>
<td>Brienner Str. 18</td>
<td>80333</td>
<td>München</td>
<td><a href="http://www.bayernlb.de">www.bayernlb.de</a></td>
</tr>
<tr>
<td>Bayern-Versicherung Lebensversicherung AG</td>
<td>Maximilianstr. 53</td>
<td>80538</td>
<td>München</td>
<td><a href="http://www.vkb.de">www.vkb.de</a></td>
</tr>
<tr>
<td>Berufliche Fortbildungszenren d. Bay. Wirtschaft gGmbH</td>
<td>Infanteriestraße 8</td>
<td>80797</td>
<td>München</td>
<td><a href="http://www.bfz.de">www.bfz.de</a></td>
</tr>
<tr>
<td>Bulthaup München GmbH</td>
<td>Herrmstr. 44</td>
<td>80539</td>
<td>München</td>
<td><a href="http://www.bulthaup.de">www.bulthaup.de</a></td>
</tr>
<tr>
<td>D.A.S. Allg. Rechtsschutz AG</td>
<td>Thomas-Dehler-Str. 2</td>
<td>81737</td>
<td>München</td>
<td><a href="http://www.bulthaup.de">www.bulthaup.de</a></td>
</tr>
<tr>
<td>DAB Bank AG</td>
<td>Landsberger Str. 428</td>
<td>81241</td>
<td>München</td>
<td><a href="http://www.dab-bank.com">www.dab-bank.com</a></td>
</tr>
<tr>
<td>E.ON Energie AG</td>
<td>Brienner Str. 40</td>
<td>80333</td>
<td>München</td>
<td><a href="http://www.eon-energie.com">www.eon-energie.com</a></td>
</tr>
<tr>
<td>Estee Lauder Companies GmbH</td>
<td>Leopoldstr. 256</td>
<td>80807</td>
<td>München</td>
<td><a href="http://www.extee-lauder.de">www.extee-lauder.de</a></td>
</tr>
<tr>
<td>HVb Payments &amp; Services GmbH</td>
<td>Margaretha-Ley-Ring 10</td>
<td>85609</td>
<td>Aschheim</td>
<td><a href="http://www.hvbgroup.com">www.hvbgroup.com</a></td>
</tr>
<tr>
<td>Marsh GmbH</td>
<td>Marsstr. 11</td>
<td>80539</td>
<td>München</td>
<td><a href="http://www.marsh.de">www.marsh.de</a></td>
</tr>
<tr>
<td>Münchener Rück AG</td>
<td>Königstr. 107</td>
<td>80802</td>
<td>München</td>
<td><a href="http://www.munichre.com">www.munichre.com</a></td>
</tr>
<tr>
<td>Obermeyer Planen + Beraten GmbH</td>
<td>Hansastr. 40</td>
<td>80686</td>
<td>München</td>
<td><a href="http://www.opb.de">www.opb.de</a></td>
</tr>
<tr>
<td>Pfla Content GmbH</td>
<td>Max-von-Eyth-Str. 3</td>
<td>85737</td>
<td>Ismaning</td>
<td><a href="http://www.pfla.com">www.pfla.com</a></td>
</tr>
<tr>
<td>Roland Berger Strategy Consultants GmbH</td>
<td>Arabelastr. 33</td>
<td>81925</td>
<td>München</td>
<td><a href="http://www.rolandberger.de">www.rolandberger.de</a></td>
</tr>
<tr>
<td>S-Bahn München GmbH</td>
<td>Orleansplatz 9a</td>
<td>81667</td>
<td>München</td>
<td><a href="http://www.s-bahn-muenchen.de">www.s-bahn-muenchen.de</a></td>
</tr>
<tr>
<td>Stadtsparkasse München</td>
<td>Sparkassenstr. 2</td>
<td>80331</td>
<td>München</td>
<td><a href="http://www.sskm.de">www.sskm.de</a></td>
</tr>
</tbody>
</table>

### Other knowledge-intensive locations

#### Research institutes

- Fraunhofer Society: www.fraunhofer.de
- Max Planck Society for the Advancement of Science: www.mpg.de
- Helmholtz Association of German Research Centers: www.helmholtz.de
- Leibniz Association: www.wgl.de
- Bavarian Academy of Sciences and Humanities: www.badw.de

#### Patent system

- German Patent and Trade Mark Office: www.dpma.de
- Federal Patent Court: www.bundespatentgericht.de
- Patentanwaltskammer (patent lawyers' association): www.patentanwaltskammer.de
- Fraunhofer Patent Center for German Research: www.pst.fraunhofer.de
- Munich Intellectual Property Law Center: www.miic.de

#### Technology transfer centers and founder centers

- Start-up in Bavaria: www.startup-in-bayern.de
- Bavarian Technology Transfer Network: www.tt-netz-bayern.de
- Chamber of Handicrafts for Munich and Upper Bavaria (HWK): www.dwk-muenchen.de
- Chamber of Industry and Commerce for Munich and Upper Bavaria (IHK): www.muenchen.ihk.de
- City of Munich, Department of Labor and Economic Development: www.muenchen.de/business
- TUM-Tech GmbH: www.tumtech.de
- Kontaktstelle für Forschungs- und Technologietransfer der LMU München (Technology Transfer Point of the University of Munich): www2.uni-muenchen.de/kft/index.htm
Incubators and accelerators
www.213.183.19.252/publikationen/Inkubatoren_d.pdf

Trade fairs
Munich Trade Fairs International Group
www.messe-muenchen.de
M,O,C Exhibition Center Munich
www.moc-muenchen.de

Schools
Städtischer Schul- und Bildungsserver
(Municipal information on schools in Munich) www.musin.de

Universities/colleges
Ludwig-Maximilians-University of Munich
www.uni-muenchen.de
Technical University Munich
www.tum.de
Munich University of Applied Sciences
www.fh-muenchen.de
Bundeswehr University Munich
www.unibw.de
Munich Academy for Television and Film
www.hff-muenchen.de

Further education and adult education
Bundesagentur für Arbeit, München
(Employment center, Munich) www.arbeitsagentur.de
MedienCampusBayern e.V.
www.mediencampus-bayern.de
Münchner Volkshochschule
(Adult Education Center, Munich) www.mvhs.de

Libraries
Bavarian State Library
www.bsb-muenchen.de
Library of the Deutsche Museum
www.deutsches-museum.de/bib/biblio/biblio.htm
University Library of LMU Munich
www.ub.uni-muenchen.de
University Library of TUM Munich
www.biblio.tu-muenchen.de
Libraries in Munich
www.muenchen.de/Rathaus/lhm_alt/mde/referat/kultur/institute/43783/literat.html#bib
Library of the Munich University of Applied Sciences
www.fhm.edu

Museums and exhibition centers
Museums in Bavaria
www.museen-in-bayern.de
Museums in Munich
www.muenchen.de/Rathaus/raw/Tourismusamt/Sehenswaerdigkeiten791/Museen/114992/index.html

Theaters
Theaters in Munich
www.muenchen.de/Rathaus/kult/theater/37928

City of Munich / Free State of Bavaria
Information about Munich in the web
www.muenchen.de
City of Munich, Economic informations in the web
www.muenchen.de/arbeitundwirtschaft
State of Bavaria in the web
www.bayern.de

Bibliography and list of sources

Munich’s head start in knowledge

Metropolitan regions compared
Munich – leading region of knowledge in Germany
Map: see above

The foundation: education, communication and accumulation of knowledge
Schools in Munich
Map: Schul- und Kultusreferat der LH München
Life-long-learning in Munich: adult education and further education
Map: Pressestelle der Münchner Volkshochschule

Universities and colleges in Munich
Bayernisches Landesamt für Statistik und Datenverarbeitung 2004: Die Studenten an den Hochschulen Bayerns. München; Euricur (Hrsg.) 2003: The Student City. Strategic Planning for Students’ Communities in EU Cities. Rotterdam; Euricur (Hrsg.) 2004: European Cities in the Knowledge Economy, Rotterdam; Pressestelle der FH München; Pressestelle der LMU München; Pressestelle der TU München

The generation of knowledge: research and development in the public and private sectors
Research and development in large companies in the Munich area
Map: Erhebung Sozialwissenschaftliche Geographie, LMU München

Research and development at universities and colleges in Munich
Map: Erhebung Sozialwissenschaftliche Geographie, LMU München

Research establishments in the Munich area
Map: see above

Prime movers of urban economic development: knowledge and technology intensive disciplines
Software industry in the Munich area

The telecommunications industry in the Munich area

Medical technology in Munich

Environmental technology in the Munich area
Map: IHK-Umweltfirmen-Informationssystem UMFIS, April 2005; Bayern International GmbH (Hrsg.): Key Technologies in Bavaria 2005. CD-Rom, München

Munich as a center of the media
Munich as a financial center


Synergies in the city of knowledge: institutions of knowledge transfer and knowledge clusters
Technology transfer and support for company founders in Munich

Munich: center of the patent system

The biotechnology region of Munich
Map: Bayem International GmbH (Hrsg.): Key Technologies in Bavaria 2005. CD-Rom, München; Datenbank der Bio² AG.
http://www.bio-m.de; IZB-Online: http://www.izb-online.de; Patentserver des BMBF. http://www.patente.bmbf.de

The public health system in the Munich area

Munich – data hub and gateway
Data hub and gateway Munich

Culture and art in the city of knowledge: places of inspiration
Libraries in Munich


Museums and exhibition centers in Munich

Theaters and music performance centers in Munich

Strategies for Munich as a City of Knowledge
Strategic fields of activity
Eunicur (Hrsg.) 2005: European Cities in the Knowledge Economy. Rotterdam.
Cover: Deutsches Museum/S. Wameser; Rudolf Schleich; Bundesverband Solarindustrie (BSi); LMU München; Flughafen München GmbH, W. Hennies; Forschungszentrum für Umwelt und Gesundheit; Linde Gas AG; LH München, Tourismusamt, H. Gebhardt; Pinakothek der Moderne, J. Weber; München Stadion GmbH; Siemens AG; Presse- und Informationsamt München, M. Nagy;

Page 7  LH München, Tourismusamt, T. Krüger
Page 9  Presse- und Informationsamt München, M. Nagy
Page 11 Gasteig München GmbH / Ansorg, Hans Georg Esch
Page 13  TU München
Page 15  Hot bird 2 © EADS, F. Watbled
Page 19  LMU München; TU München
Page 21  Max-Planck-Gesellschaft
Page 23  Microsoft Deutschland GmbH
Page 25  Siemens AG; O₂ GmbH & Co. OHG
Page 27  Siemens AG; Rodenstock GmbH
Page 29  Bundesverband Solarindustrie (BSi); Linde Gas AG
Page 31  Pro Sieben, H. Rauner; Bavaria Film, S. Anneck
Page 33  Börse München; LH München, Tourismusamt, C. Reiter
Page 35  MTZ – Münchner Technologie- und Transferzentrum
Page 37  Europäisches Patentamt; Deutsches Patent- und Markenamt
Page 39  Bio⁹ AG
Page 41  Klinikum Großhadern; S. Hartmann; Klinikum Rechts der Isar
Page 45  Bayerische Staatsbibliothek
Page 47  Pinakothek der Moderne, J. Weber; Deutsches Museum
Page 49  Nationaltheater, W. Hösl; Landeshauptstadt München, Tourismusamt, R. Hertz
Page 50  LH München, Tourismusamt, Aerobild Luftbild
Page 51  LH München, Tourismusamt, A. Müller; LH München, Tourismusamt, C. Reiter