

Hot Spots in CEE

The Roland Berger CEE city ranking survey 2009



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Objective of the study and overall results

Central and Eastern Europe (CEE) is one of the world's most fascinating growth regions. Many companies began investing here several years ago, fueling significant travel within the region and between its leading cities. Tourists too are increasingly discovering this part of Europe. Just as businesses strive to establish a strong market position – not only in their home countries, but also internationally – so cities are keen to cultivate distinctive profiles. The cities of Central and Eastern Europe are thus working hard to become attractive both as a place to live and as a place where international organizations will want to do business.

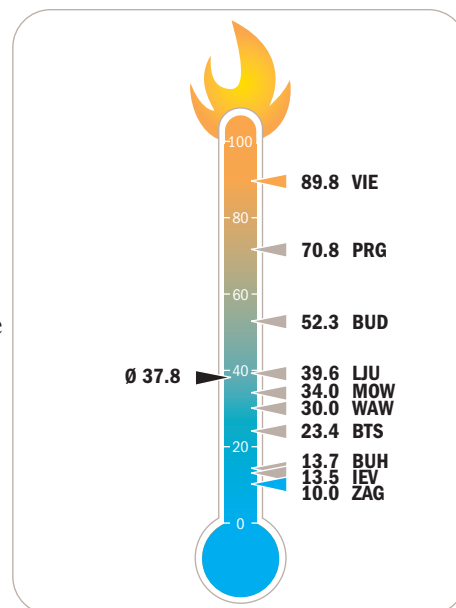
Capital cities in CEE are thus racing to improve their positioning – and Roland Berger Strategy Consultants believes that the pace is gathering momentum. It is therefore high time for a benchmark study to paint a clear and comparable picture of the current status. This CEE city study, the first conducted by Roland Berger, aims to provide a solid and objective understanding of the individual cities' positions in respect of each other. It also provides specific recommendations for each city's development. Like businesses, cities too must strive to grow and evolve in line with clearly defined master plans that set quantified objectives. In doing so, they must exploit the strengths and benefits they offer, thereby occupying a prominent position in the international arena. The fields analyzed include infrastructure, education, innovation, internationality, standard of living and culture.

Vienna comes top of the overall ranking, followed by Prague and Budapest. Although the Austrian capital wins by a comfortable margin, other cities lead the field at least as far as certain criteria are concerned. Ljubljana leads the innovation ranking table, for instance, followed by Budapest and Prague – and ahead of Vienna. On the other hand, Prague outshines Vienna in the cultural rankings.

We trust that you will enjoy reading this study, and that reflecting on its findings will fuel fruitful debate with – and within – the cities covered. Let yourself therefore be inspired and maybe surprised.

The study's authors

May 2009



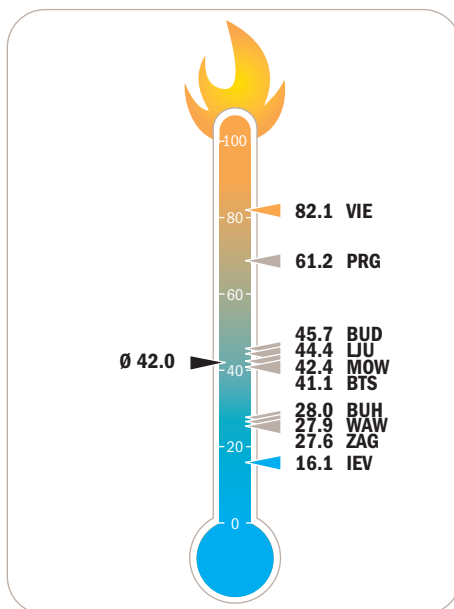
Overall results

Results by criteria:

Infrastructure

A well developed city infrastructure gives local inhabitants mobility, improves their living conditions and is a critical success factor in keeping the city competitive. The Overall Roland Berger CEE City Infrastructure Index is based on four key performance indicators (KPIs):

- > **Air traffic – Number of direct flight destinations served by the main airport:** A large number of direct flights from an airport is necessary to good international connectivity. This is important to enable businesses to access markets and move goods, services and people quickly and efficiently.
- > **Public transport – Capacity of the public transport system relative to population:** Sufficient public transport capacity guarantees smooth inner-city traffic flows and relieves the burden of private road traffic.
- > **Healthcare – Number of magnetic resonance imaging (MRI) units relative to population:** Availability of a large number of MRI units is seen as representative of the quality of the wider diagnostic services accessible to the population at large. It is also indicative of shorter wait times for diagnostic care.
- > **Information and communication technologies (ICT) – Broadband penetration rate for private households:** A high rate of broadband penetration among private households is an indicator that broadband is easily accessible and that subscribing to broadband is attractive to a large part of the population. Broadband Internet access significantly increases productivity and allows users to cope with the increasing bandwidth demanded by new applications.



Infrastructure – overall results

Vienna is the clear winner of the Overall Roland Berger City Infrastructure Index, more than 20 points ahead of Prague. Broken down into the individual criteria, Vienna places first in the healthcare and ICT categories, second in air traffic and fourth in public transport. Prague with 61.2 points ranks first in public transport and third in air traffic. Third in the overall ranking is Budapest (45.7 points). The city places second in healthcare and ICT. Warsaw (27.9), Zagreb (27.6) and Kyiv (16.1) do rear guard.

A closer look at Vienna, the top ranking city, reveals a number of critical success factors:

- > **Master plan:** The City of Vienna set up a transport master plan in 2003 to develop and improve the city's public transport system. For its part, the Austrian Regulatory Authority for Broadcasting and Telecommunications produced an ICT master plan in 2005, which, among other things, aimed at driving up broadband penetration in Austria.
- > **Clear strategic positioning:** Vienna International Airport has successfully positioned itself as the foremost east-west hub in the entire CEE region.
- > **Focus on investment:** Cities such as Vienna with high-quality healthcare infrastructures benefit from major programs of recurring investment. This allows leading cities to constantly renew and modernize their technical infrastructure.

Air traffic

The Roland Berger KPI for air transport is the number of direct destinations served by the main airport. This figure is the principal measure of the level of mobility offered by an airport, alongside the frequency of service provided to each of these destinations. Many industries heavily rely on international links and need close access to a hub airport to facilitate global networking. The level of international air traffic mobility plays a major role in the business world. On the one hand, it is an important criterion for international corporate groups as they consider where to set up regional headquarters and thus evaluate the attractiveness of different cities. On the other hand, a busy international airport directly contributes to the entire country's international competitiveness.

Number of direct flight destinations 2008

Rank	City	Thermometer value
1	Moscow – Domodedovo	100.0
2	Vienna – Schwechat	84.8
3	Prague – Ruzyně	50.5
4	Warsaw – Frederic Chopin	38.4
5	Budapest – Ferihegy	32.3
6	Kyiv – Boryspil	30.8
7	Bratislava – M. R. Štefánik	18.2
8	Bucharest – Henri Coandă	12.1
9	Zagreb – Pleso	3.5
10	Ljubljana – Jože Pučnik	0.0
CEE average		37.1

Airports in the CEE region can be divided into three categories. Three airports are clearly in the lead. Moscow Domodedovo occupies first place, serving 222 destinations (and carrying 20.4 million passengers in 2008). It is followed by Vienna, which offers direct flights to 192 destinations (and carried 19.8 million passengers in 2008). Prague comes third, serving 124 destinations (and carrying 12.7 million passengers in 2008). The airports of Warsaw (100 destinations), Budapest (88 destinations) and Kyiv (85 destinations) trail these three but still offer an adequate number of destinations for business travelers. At the end of the ranking are four airports with relatively poor networks. Bratislava serves 60 destinations, followed by Bucharest with 48 destinations, Zagreb with 31 and, at the bottom of the pile, Ljubljana, which serves a mere 24 destinations. Interestingly, although Bratislava only ranks seventh in terms of the absolute number of destinations served, it comes first relative to its population.

Of the five top ranking airports, three are privately owned:

- > Domodedovo International Airport was fully privatized in 1996.
- > Vienna International Airport floated 50 percent of its shares in 2001 and is one of the few publicly traded airports in Europe.
- > Budapest Ferihegy International Airport was fully privatized in 2005.

The other CEE airports remain state-owned at present. However, a wave of privatization is planned for the coming years, when governments intend to sell off their majority stakes in these airports. The Czech government, for instance, has plans to privatize Prague Ruzyně International Airport within the next two years (after the sale of national airline CSA). The same goes for Bucharest Henri Coanda International Airport. Such moves will without doubt give these airports a more international outlook and should increase their connectivity in terms of the number of destinations served. Bratislava M. R. Štefánik International Airport was due to be privatized in 2005, but the tender process was blocked by the newly elected Slovak government.

As a general rule, the region's most successful airports are those that have undergone major investment programs and been privatized in recent years, or those that are candidates for privatization:

- > Following privatization, Domodedovo International Airport underwent a large-scale reconstruction project. This involved construction of an international cargo terminal, reconstruction of the runways and an upgrade to landing facilities and systems. A further investment program planned for the years ahead will enlarge the two existing terminals and add another two. Together, these actions will boost passenger handling capacity from 20 million to 35 million.
- > Vienna International Airport plans to open a third terminal (measuring 76,000 square meters and providing 51 new gates) and start construction of a third runway in the near future. Planned future projects include the enlargement of the railway station (completion is scheduled for 2012) and construction of a direct rail link to Bratislava.
- > Prague Ruzyně International Airport underwent a major revitalization program worth 330 million euro in 2005, including construction of a new North Terminal building and the associated infrastructure (54,000 square meters of new floor space), construction of a new parallel runway, and the general expansion and upgrading of various other airport facilities.
- > Budapest Ferihegy International Airport launched a 260 million euro investment program in 2008. The aim is to expand and modernize the airport's infrastructure, focusing primarily on construction of a new passenger terminal (50,000 square meters) and revitalization of one old terminal (completion is scheduled for summer 2010). Other projects include construction of a cargo terminal and the expansion of airport capacity (90,000 square meters of new apron space).
- > The Slovak government plans to invest 150 million euro in the next few years to increase the capacity of Bratislava M. R. Štefánik International Airport from two million passengers today to five million passengers.
- > In Romania the government intends to list some of the airport shares (around 5%) on the stock exchange – but otherwise there are no clear full privatization intentions

It is a striking fact that all the successful airports in our study pursue clear strategies:

- > The strategic objective of Domodedovo International Airport is to position itself as a multimodal transportation hub connecting the European and Asia-Pacific regions.
- > The strategic objective of Vienna International Airport is to consolidate and further develop its position as the most important point of access to Eastern Europe: The airport thus already serves 47 Eastern European destinations – far more than Prague's 28 and Budapest's 21.
- > Bratislava M. R. Štefánik International Airport has clearly positioned itself as a low-cost carrier hub.

In summary, the following critical success factors can be identified for successful airports in the CEE region:

- > **Privatization** is a major factor in driving both investment and internationalization, as vividly witnessed by Moscow Domodedovo. In recent years, this airport has taken over from Sheremetyevo, the long-standing front-runner, in terms of number of destinations served.
- > The size of a city's population obviously has an influence on the number of destinations served (see Ljubljana, which ranks bottom, for instance). Even so, some small airports such as Bratislava have developed forceful momentum by adopting a clear strategic position in recent years, outperforming large cities such as Bucharest in terms of the absolute number of destinations served.
- > Clear **strategic positioning** is also an important factor to attract new airline partners. Domodedovo has positioned itself as a Eurasian hub, for example, Vienna as an East-West hub and Bratislava as a low-cost carrier hub. By contrast, the airports of Bucharest and Zagreb have not yet adopted a clear position and thus trail far behind.

Domodedovo International Airport



Public transport

An economically well developed urban region depends on the mobility of its population. This is facilitated by an extensive public transport network with adequate capacity relative to the number of inhabitants. Therefore, the Roland Berger KPI measures the capacity of the public transport system relative to the population.

Capacity of the public transport system

2007

Rank	City	Thermometer value
1	Prague	100.0
2	Budapest	81.6
3	Bratislava	44.9
4	Vienna	43.4
5	Ljubljana	39.7
6	Zagreb	29.8
7	Bucharest	27.6
8	Kyiv	12.0
9	Warsaw	3.8
10	Moscow	0.0
CEE average		38.3

Prague, the top-ranking city, has public transport capacity of around 16,000 passenger seat kilometers per inhabitant. Budapest comes second with 14,000 and Bratislava third with 9,700. The latter is nearly matched by Vienna with 9,600 passenger seat kilometers per inhabitant.

Geographic coverage of the urban area by the public transport network is naturally an important factor for a high-quality public transport system. Having said that, capacity relative to the size of the local population is even more important. Bucharest, for example, leads the fields in terms of geographic coverage, having one of the most dense public transport networks in Europe. However, since its population density is also very high (at 8,500 persons per square kilometer), the Romanian capital ranks only seventh relative to its population. By contrast, Prague's public transport network covers relatively little of the urban region but still ranks first in terms of per-capita capacity.

Our analysis reveals that even small cities with no subway network can still provide their populations with sufficient capacity by organizing an extensive tramway and bus network. Bratislava and Zagreb rank third and sixth respectively, despite the lack of a subway, while Moscow comes only tenth – despite its nearly 300 kilometers of subway lines.

Top scorer Prague relies heavily on its 55 kilometers of subway lines, which make up more than half of the city's total public transport capacity. Its subway network is typical of the models commonly used in CEE: three main lines crossing at three central stations and thus forming a triangle across the city

center. The tramway and bus systems are roughly equivalent in terms of development, each providing 20 percent of local public transport capacity.

Budapest's public transport network comprises 3 subway, 32 tramway, 149 bus and 14 trolley bus lines. The most important mode of transport is clearly the bus. Around 870 kilometers of bus networks account for nearly half of total public transport system capacity, followed by the tramway (27 percent) and the subway (23 percent), which only covers 35 kilometers. Having said that, subway capacity will increase in the coming years as a fourth line is planned to go into service in 2011.

Bratislava has no subway network, but still boasts 88 kilometers of tramway lines and nearly 400 kilometers of bus lines. The tramway is the most important mode of transport here, covering nearly 60 percent of the total capacity provided.

The public transport network in Vienna comprises 5 subway, 31 tramway and 80 bus lines. The subway is the most successful inner-city mode of transport, extending over 69 kilometers and providing 60 percent of total public transport system capacity. The second most important mode of transport is the tramway (26 percent), followed by the bus (14 percent). In the years ahead, the main improvement to the public transport network will be the extension of a subway line across the Danube. The new service should be operational in 2010, enlarging the subway network to a total 75 kilometers.

Vienna's transport master plan, ratified in 2003, aims to improve inner-city mobility. It sets goals and strategic directives for development of the city's public traffic system over the next 20 years. The attractiveness of local public transport is reflected in the split between public and private traffic. Currently, the share of public traffic amounts to 35 percent in Vienna, up from 29 percent in 1993. One of the goals set in the master plan is to raise public transport's share of traffic to 45 percent by 2020. This can only be achieved by pressing ahead with realization of the integrated public transport concept. Two keys in particular will enable Vienna to make its public transport system more attractive: greater tram and bus support for the existing subway network along the whole of its service lines; and more park and ride parking space for commuters.



Tramway in Zagreb

Our survey of quality issues reveals the following critical success factors for a high-quality public transport system:

- > The **density** of the public transport network is an important factor to ensure inner-city mobility. However, an even more important indicator is the **capacity** provided by the public transport system **relative** to the local **population**. Prague and Bucharest clearly illustrate this point: Prague's public transport network has a relatively low density but ranks top relative to its population, whereas Bucharest has a dense network but low capacity relative to its population.
- > A **dense subway network** generally improves the quality of the transport system, witnessed by Prague and Vienna. On the other hand, Budapest, Bratislava and Zagreb prove that a subway is not indispensable. All three cities lack subways but still achieve top rankings.
- > A **transport master plan** helps a city define and realize long-term targets and strategic directives. Vienna presents a good example of how supporting actions can be adopted and monitored over the years.
- > To be more attractive than the use of private cars, a public transport system needs an integrated **strategy that interlinks** all modes of public transport and also provides adequate park and ride facilities for commuters.

Healthcare

A modern urban healthcare infrastructure provides high-quality care to the local population. Alongside the availability of sufficient doctors and hospital beds (especially for emergency treatment), this infrastructure must also include modern technical equipment such as advanced diagnostic equipment. Roland Berger analyzed the availability of magnetic resonance imaging (MRI) units relative to the population as a way to assess the level of technical healthcare infrastructure offered by each city. MRI units deliver high-quality imaging results but are scarce in many countries as they cost around 1.5 million euro apiece. In addition, the unit cost of MRI scans is higher than for X-rays and ultrasound.

Number of magnetic resonance imaging (MRI) units available, relative to population
2008

Rank	City	Thermometer value
1	Vienna	100.0
2	Bratislava	73.4
3	Ljubljana	65.7
4	Prague	44.5
5	Zagreb	40.8
6	Warsaw	33.4
7	Bucharest	30.5
8	Budapest	27.1
9	Kyiv	21.7
10	Moscow	0.0
Average		43.7

The leader in the healthcare category is Vienna, which boasts an installed base of 22 MRI units per million people. In second place comes Bratislava with 16 MRI units per million people, followed by Ljubljana (15 units). At the bottom of this ranking are Moscow, where only 2 MRIs are available per million people, and Kyiv, with 7 MRIs per million people.

This ranking table correlates well with healthcare expenditure (the sum of public and private healthcare expenditure) as a percentage of GDP. At 10 percent of GDP, Austria's healthcare spend is the highest in the CEE region. Slovenia comes second with 9 percent of GDP and third in the MRI ranking. Higher-income countries such as Austria and Slovenia, whose GDP per capita exceeds 30,000 US dollar, have more money to invest in the healthcare infrastructure than lower-ranking countries such as Ukraine, where GDP per capita is 7,400 US dollar and Russia (16,000 US dollar).

The city of Vienna plans to invest massively in its healthcare infrastructure in the next few years:

- > An investment program of 700 million euro is scheduled for the years ahead, of which 350 million euro will be spent on new nursing homes and 250 million euro on the hospital infrastructure.
- > 59 million euro will be channeled into the AKH, the city's principal hospital, including investments in new diagnostic and radiotherapy equipment.

To summarize: Our study enabled us to identify the following critical success factors for the healthcare infrastructure:

- > The quality of a city's healthcare infrastructure correlates directly with the level of a country's development. **High-income** countries such as Austria and Slovenia quite simply have more money to invest in their healthcare infrastructure than low-income countries such as Ukraine or Russia.
- > The leading cities in the healthcare infrastructure rankings (such as Vienna) **invest permanently and heavily** in order to continually renew their infrastructure.

Information and Communication Technology (ICT)

Broadband Internet connectivity is an important accelerator of economic development, providing benefits for many industries and increasing a country's productivity. Broadband access is also a prerequisite to allow large amounts of information to be transferred, and to cope with the increasing bandwidth required by computer and entertainment applications. Households can make use of more sophisticated Internet applications as a result.

Broadband penetration rate for private households (excl. mobile broadband)

2008

Rank	City	Thermometer value
1	Vienna	100.0
2	Ljubljana	72.2
3	Moscow	69.4
4	Prague	50.0
5	Bucharest	41.7
6	Budapest	41.7
7	Warsaw	36.1
8	Zagreb	36.1
9	Bratislava	27.8
10	Kyiv	0.0
	Average	47.5

Landline broadband penetration in CEE has lagged behind Western Europe in recent years. The average penetration rate in the CEE capitals covered by our study currently stands at 40 percent, compared to around 60 percent in Western European capitals. However, telecom operators in the CEE region have invested heavily in the infrastructure and will continue to do so, especially in urban areas. The gap is therefore expected to diminish in the years ahead.

Vienna has the highest broadband penetration rate. 61 percent of all Viennese households have broadband subscriptions, followed by Ljubljana (51 percent) and Moscow (43 percent). At the bottom of the rankings is Kyiv, where broadband penetration is only 25 percent. Second-last is Bratislava with 35 percent. After being repeatedly criticized for its lack of a national broadband strategy, the Austrian government published an ICT master plan in 2005. The plan analyzes the country's strengths and weaknesses and assesses Austria's current position on the international ICT market. Strategic and operational goals were then developed on the basis of this master plan, together with a package of appropriate actions. Some of the targets of the plan to be reached by the end of 2008 were:

- > Provide 8 Mbps connections or better for 60 percent of Austrian households
- > Increase the broadband penetration rate in Austria to 50 percent of all households and 90 percent of all companies
- > Increase ICT expenditure to 8 percent of GDP
- > Increase PC penetration to 60 percent of inhabitants
- > Increase e-commerce to 15 percent of GDP

Based on the ICT master plan, broadband penetration in Austria has risen from 33 percent in 2005 to 55 percent in 2008. In Vienna, the same figure climbed from 45 percent to 61 percent. Mobile broadband penetration has also enjoyed enormous growth rates in Austria in recent years and already accounts for 38 percent of all broadband connections, compared to only 15 percent in Germany and 13 percent in Switzerland. This is mainly due to fierce competition among mobile phone operators in Austria.

Despite the lack of large-scale competition, Slovenia boasts high levels of landline, mobile and Internet usage, similar to those in Western Europe. Ljubljana has the second-highest broadband penetration rate of all CEE capitals, at 51 percent. The number of broadband users has risen sharply since 2005, when incumbent operator Telekom Slovenije unbundled its ISDN digital telephony and broadband Internet packages. Since then, customers have no longer had to buy an ISDN package to get a broadband connection. Slovenia is also out in front with respect to the next-generation fiber-to-the-home (FTTH) technology data transmission. Telekom Slovenije plans to spend up to 450 million euro between now and 2015 to roll out this technology. In the process, high-speed access will become available to 70 percent of households.

Internet use in Russia is heavily concentrated in Moscow, the city that ranks third in our study, and St. Petersburg. In other areas, the broadband infrastructure is still poor because of low PC penetration rates and much lower income levels compared to the country's two major cities. Broadband usage is nevertheless increasing for two main reasons. One is that telecom operators are investing in the network infrastructure. The other is the rise of triple-play technology products, which are attractive to both operators and end users. Competition in Moscow's broadband market is already fierce and will intensify further in the years ahead, as major players have set very ambitious targets to enlarge their market shares.

Close analysis of the broadband penetration rate reveals, that a master plan is the most important success factor. It is useful to set targets and centrally coordinate efforts to promote ICT infrastructure. Vienna is a good example. Its broadband penetration rate rose sharply after the Austrian ICT master plan came into force.

Education

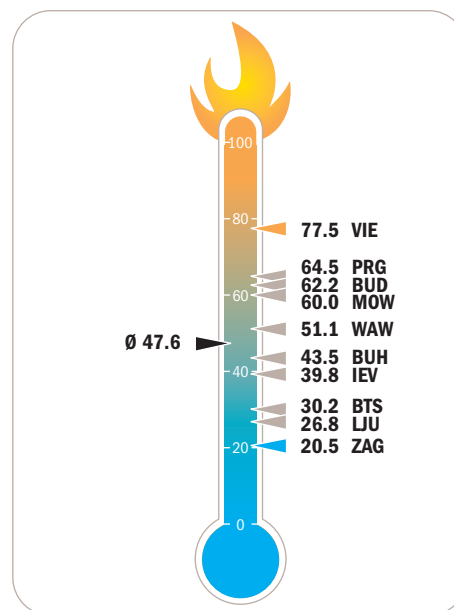
Education is a crucial asset for cities keen to develop industries that go beyond simple production processes and basic products. In a globalizing world, a widespread pool of well-educated employees covering a broad array of specializations is essential. In addition, this labor pool must be able to adapt rapidly to an ever-changing environment. The Overall Roland Berger CEE City Education Index consists of four KPIs:

- > **Availability of teachers – Ratio of pupils per teacher:** The more teachers and smaller classes are granted to pupils in elementary, secondary and grammar schools the higher the engagement towards individual needs and facilitation; quality of secondary education is indispensable in creating a bright future for individuals.
- > **Secondary education – Number of secondary education graduates:** Globalization and the growing demand for a more sophisticated labor force, combined with the spread of knowledge-based industries, naturally makes cities more attractive that boast a high rate of secondary education.
- > **Tertiary education – Number of tertiary education graduates:** Knowledge and the advanced skills taught by higher education are critical determinants of a city's economic growth and standard of living. Over time, learning outcomes are transformed into goods and services, greater institutional capacity, a more effective public sector, a stronger civil society and a better investment climate.
- > **Top universities – Number of universities among the top 500 as defined by the QS World University Rankings:** The quality of universities is a crucial factor for unfolding brilliant minds within a city's pool of well-educated employees.

Vienna is the winner of the Overall Roland Berger City Education Index, scoring 13 points more than second-placed Prague. The Austrian capital won two first places in the quality of teaching and top universities categories and one third place in secondary education, though it lagged behind in tertiary education. Third place went to Budapest, which scored 62.2 points. Bottom of the list were Zagreb and Ljubljana.

Looking at Vienna, the top-ranking city, a number of critical success factors can be identified:

- > **High government spending on education:** In 2007, the Austrian government spent 5.1 percent of GDP on education. Compared to the 4.4 percent of GDP invested by second-ranking Czech Republic, that is a high figure indeed.
- > **A service-based society:** In cities such as Vienna, where most jobs are in the service sector rather than industrial production, a good education is crucial. Most parents push their children toward good educational achievements. For their part, the children themselves are generally willing to do well at school.



Education – overall results

- > **A legal framework that guarantees funding:** Austrian law entitles children to receive funded education up to the tertiary level. Normally, their parents will pay. Where parents do not have enough money, the government and other institutions provide support to fill the gap between what parents can afford and the minimum requirement.

Availability of teachers

Measuring the ratio of pupils per teacher in primary, secondary and grammar schools accommodates two important aspects of education at once. On the one hand, the fewer pupils one teacher has in his or her charge, the more time a teacher can devote to the individual needs of each pupil. On the other hand, the lower the ratio, the more local and national government must invest in education.

Ratio of pupils per teacher in primary, secondary and grammar schools 2007

Rank	City	Thermometer value
1	Vienna	100.0
2	Kyiv	88.2
3	Moscow	88.2
4	Warsaw	88.2
5	Budapest	61.8
6	Zagreb	61.8
7	Prague	26.5
8	Ljubljana	11.8
9	Bratislava	8.8
10	Bucharest	0.0
CEE average		53.5

In this category, Vienna comes first, followed by Kyiv and Moscow. The Austrian government emphasizes action to reduce class sizes and, consequently, the ratio of pupils per teacher. Smaller classes are realized especially in subjects that require interactive and one-on-one teaching (such as foreign languages and mathematics). In general, primary and secondary schools have a higher ratio of teachers to pupils than grammar schools, although primary schools require more intensive tuition. At the same time, secondary schools are losing in popularity relative to grammar schools in Austria.

Some 1,500 extra teachers were employed in Austria in the 2007/08 academic year, followed by another 760 in 2008/09. Currently, the government is discussing reforms that, if implemented, would increase teachers' working hours while providing higher budgets for smaller classes and remedial German courses (for both native Austrian children and pupils of other nationalities).

Secondary education

The Roland Berger KPI for secondary education measures how many inhabitants living in each city gained a secondary education diploma (ISCED 3-4a) or equivalent. This metric does take account both of residents who earned this diploma in the city itself and residents who share the same level of education but who moved here from other cities and countries.

Number of secondary education graduates (ISCED 3-4a) in employable population 2007

Rank	City	Thermometer value
1	Prague	100.0
2	Bratislava	95.0
3	Vienna	87.5
4	Bucharest	73.8
5	Budapest	50.2
6	Ljubljana	31.4
7	Kyiv	28.5
8	Zagreb	20.4
9	Moscow	13.2
10	Warsaw	0.0
CEE average		50

In this category, Prague comes top of the list. 65 percent of its inhabitants have a secondary education diploma. The Czech capital is closely followed by Bratislava (64 percent) and Vienna (62 percent). The worst ranking goes to Warsaw (38 percent).

Tertiary education

The Roland Berger KPI for tertiary education measures how many residents of a city have gained a tertiary education diploma (ISCED 4c-5b) or equivalent. Like the KPI for secondary education, this measure takes account not only of residents who graduated in a given city, but also of existing graduates who moved here from other cities and countries.

Number of tertiary education graduates (ISCED 4c-5b) in employable population 2007

Rank	City	Thermometer value
1	Bucharest	100.0
2	Moscow	88.6
3	Budapest	86.7
4	Kyiv	42.6
5	Prague	31.4
6	Vienna	22.4
7	Bratislava	16.9
8	Warsaw	16.0
9	Ljubljana	14.1
10	Zagreb	0.0
CEE average		41.9

The leader in this category is Bucharest, 31 percent of whose population are graduates from tertiary education. Moscow and Budapest rank second and third, at approximately 30 percent each. The city with the lowest proportion of graduates is Zagreb, with just 19 percent. Interestingly, the top three rated cities rank only in mid-table as far as secondary education is concerned. This can be interpreted as a sign that those pupils/students who are talented and receive parental financing continue on to higher education, while the broader masses do not even achieve a secondary education diploma.

With 35 tertiary education institutions and almost 390,000 students, Bucharest is by far the largest university center in Romania, attracting young people from the entire country. Compared to the second university center, the capital city conveys a university capacity around 5 to 6 times greater, providing at the same time considerably more career opportunities for its graduates. More than one fifth of Romania's GDP is generated by Bucharest. Net wages are around 35 percent higher in the capital city compared to the country average. Under these conditions, many tertiary graduates, especially from the Southern and Eastern regions, willingly relocate to Bucharest in search of jobs that can provide them with higher income and better career opportunities. On the other hand, in Bucharest almost 99 percent of the population has relatively easy access to primary and secondary education institutions, and therefore nearly the whole local population has the possibility to pursue tertiary education.

Vienna's relatively low position in the tertiary education figures (ranked sixth) results from a relatively high drop-out rate. This is due to three facts: First, many students work part-time to finance their studies and do not manage to sustain financing up to graduation. Second, the mass university teaching system puts no pressure on students to complete their studies, and third, students rarely finish after the minimum study period and get bogged down.

Unlike Vienna, Moscow (which came joint-second in our study on this criterion) has a university system that closely resembles the structures encountered in secondary education. On the one hand, students are allocated to groups with which they share seminars and lectures. On the other hand, students usually graduate from university after the predetermined study period. This tight system reduces the risk that students will drop out.

Top universities

The QS World ranking table currently evaluates around 600 universities worldwide and identifies the top 500¹ based on six defined indicators.

Number of universities among the top 500 as defined by the QS World University Rankings

2007

Rank	City	Thermometer value
1	Prague	100.0
1	Vienna	100.0
1	Warsaw	100.0
4	Budapest	50.0
4	Ljubljana	50.0
4	Moscow	50.0
7	Bratislava	0.0
7	Bucharest	0.0
7	Kyiv	0.0
7	Zagreb	0.0
CEE average		45.0

Prague, Vienna and Warsaw each have two universities and Budapest, Ljubljana and Moscow each have one university that rank among the world's top 500. The universities of the other cities evaluated in the Roland Berger City Ranking (Bratislava, Bucharest, Kyiv and Zagreb) do not feature in QS World's top rankings.

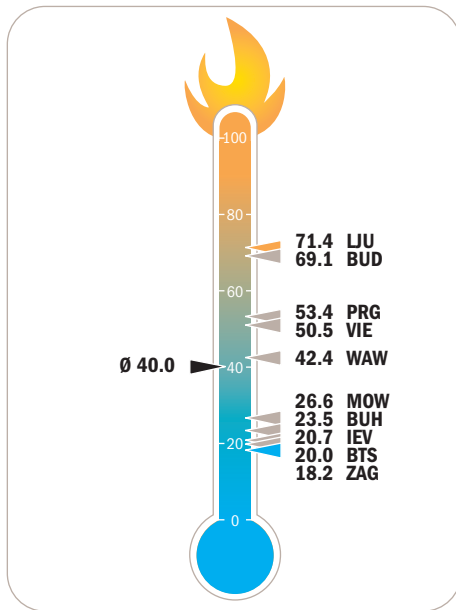
Those Viennese universities that rank among the top 500 are the University of Vienna (115th place) and Vienna University of Technology (244th place). Prague's universities are Charles University (261st place) and the Czech Technical University (above 400th place). Warsaw's top universities are Warsaw University (342nd place) and Warsaw University of Technology (above 400th place). Ljubljana boasts the University of Ljubljana, which ranks between 401st and 500th place. Vienna's universities in particular command enviably high positions in the QS World table.

University of Vienna



¹ www.qsnetwork.com

Innovation



Innovation – overall results

Innovation is another critical factor in ensuring the future prosperity of modern cities – a factor that makes them more attractive in the international arena. The Overall Roland Berger City Innovation Index consists of four KPIs:

- > **Number of business startups relative to population:** This metric is a reliable indicator of a city's entrepreneurial mindset.
- > **Number of people employed in creative industries relative to population:** The creative industries include sectors such as architecture, art, graphic art, fashion and design, music and literature, museums and libraries, software/multimedia/games/the Internet and advertisement.
- > **Number of patents relative to population:** This figure is a further indicator of a city's innovative capabilities.
- > **Research and development spending (percentage of GDP):** Since R&D spending triggers innovation, this is a very useful indirect indicator.

With 71.4 points, Ljubljana leads the field as the most innovative city in our study, slightly ahead of Budapest (69.1 points), which in turn has a comfortable lead over Prague (53.4 points) and Vienna (50.5 points). Zagreb brings up the rear with just 18.2 points.

Number of business startups

The launch of around 25,000 new businesses in 2007 (around 18 per 1,000 inhabitants) gives Budapest top slot on this score. Prague comes second with around 13 business startups per 1,000 inhabitants, followed by Bucharest with around 12. Last on the list is Moscow, whose score of around 0.5 indicates that entrepreneurial activity is still slack here and that the Russian capital has a lot of catching up to do.

Number of business startups per 1,000 inhabitants 2007

Rank	City	Thermometer value
1	Budapest	100.0
2	Prague	66.4
3	Bucharest	59.7
4	Ljubljana	56.8
5	Kyiv	44.4
6	Bratislava	37.4
7	Vienna	25.6
8	Zagreb	21.9
9	Warsaw	16.3
10	Moscow	0.0
	CEE average	42.8

The sharply increased number of established companies in Budapest can be attributed to two facts in particular. On the one hand, due to a change of the VAT (value-added tax) law all licensed traditional small-scale producers are required to have a tax number as of 2008. To obtain such a tax number, these producers established companies. On the other hand, an increased number of employees were released in Budapest and all over Hungary because of the Hungarian economic difficulties in 2007. Many of these unemployed people became entrepreneurs instead of having started to work for another employer.

Number of people employed in creative industries

Budapest leads on this criterion, as around 13 percent of the workforce is employed in creative industries. Second is Vienna, with a figure of around 12 percent, followed by Prague with almost the same number. Last are Moscow and Zagreb with around 7 percent.

Percentage of people employed in creative industries (DCMS definition) 2007

Rank	City	Thermometer value
1	Budapest	100.0
2	Vienna	95.7
3	Prague	95.2
4	Ljubljana	84.8
5	Warsaw	64.7
6	Bratislava	25.4
7	Kyiv	11.0
8	Bucharest	5.4
9	Zagreb	0.6
10	Moscow	0.0
CEE average		48.3

Remark: The UK Government Department for Culture, Media and Sport (DCMS) includes in creative industries: advertising, architecture, arts and antique markets, audio-visual media, graphics/fashion design/design, literature/publishing/print media, museums and libraries, music business, software/multimedia/internet/games, visual and performing arts

As part of its European Business & Innovation Centre Network (EBN), the European Commission established a Business and Innovation Centre (BIC) in Budapest and has been promoting the spread of creative employment. Traditionally, much architectural activity has been seen in the city in the past years and, last but not least, Budapest's University of Technology is enabling a large number of young talents to start their careers in a creative industry.

Number of patents

Moscow scores top grades here with 0.62 patents per million inhabitants, followed by Warsaw and Budapest. Prague manages just 0.07 patents per million inhabitants and thus comes bottom of this list. Russia is historically very active in this field. About 70 percent of all USSR inventions came from Russia and the major part of it from Moscow. This city is not only the capital but also the main city in the economic and scientific areas. Moscow's technical potential is top (compared with other Russian cities), also the best universities and R&D institutions are based here.

Number of national patents per million inhabitants 2007

Rank	City	Thermometer value
1	Moscow	100.0
2	Warsaw	59.9
3	Budapest	53.5
4	Ljubljana	43.9
5	Zagreb	33.5
6	Kyiv	27.5
7	Vienna	18.4
8	Bratislava	16.0
9	Bucharest	6.1
10	Prague	0.0
CEE average		35.9

Research and development spending

Ljubljana leads the field, followed by Vienna and Prague. Slovenia devotes around 5 percent of its GDP to R&D. Kyiv's R&D budget of a mere 0.23 percent puts the Ukrainian capital at the bottom of the pile.

Ljubljana in particular is very successful in boosting R&D. Today, it exerts a powerful attraction on international companies as a place to do business. At the core of the city's local government R&D program is the Technology Park Ljubljana. Established in 1996, this cluster helps companies to translate research outcomes and innovative commercial ideas into successful and internationally competitive technology enterprises. The park has already produced projects that have indeed met with international success. The City of Ljubljana is one of the founders of this project.

Research and development spending (percentage of GDP)

2007

Rank	City	Thermometer value
1	Ljubljana	100.0
2	Vienna	62.3
3	Prague	52.2
4	Warsaw	28.6
5	Budapest	22.9
6	Bucharest	22.9
7	Zagreb	16.9
8	Moscow	6.4
9	Bratislava	1.3
10	Kyiv	0.0
	CEE average	31.3

Technology Park Ljubljana

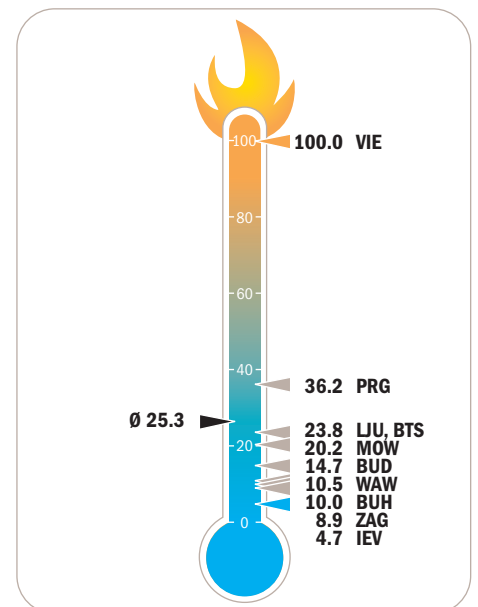


Internationality

The more international a city's outlook and general flair, the more interesting it becomes to the fiercely competitive global community as a place to do business. Truly international cities also attract young, creative high potentials who want to live and work in a multicultural environment. The Overall Roland Berger City Internationality Index therefore comprises four KPIs:

- > **Headquarters – Number of international headquarters:** When a large number of major international companies sets up international headquarters in a city, that is a powerful indicator of the city's importance as a business location. This study took account only of the headquarters of companies that generate annual revenues of over 500 million euro.
- > **Foreign students – Percentage of students from other countries:** A high percentage of students from abroad reflects a city's importance and attraction as an international learning hub.
- > **Other foreigners – Non-natives as a percentage of the population:** A large number of foreigners underlines the economic, cultural and social attractiveness of a city to immigrants from other countries. Especially in the cultural sector and in creative industries, a melting pot of various cultures and nationalities is vital to a city's healthy ongoing development.
- > **Intermarriage – Share of binational marriages:** The proportion of marriages between persons of different nationalities paints a telling picture of how well immigrant populations are able to integrate with the local community.

Vienna is the clear winner of the Overall Roland Berger CEE City Internationality Index, scoring 100 points. Prague (36.2 points) and Ljubljana/Bratislava (23.8 points each) rank second and third but trail far behind the Austrian capital. Bucharest, Zagreb and Kyiv bring up the rear.



Internationality – overall results

International headquarters

The Roland Berger KPI for international headquarters is the number of international headquarters set up in a city by international companies with annual revenues of over 500 million euro. In this context, "international" means that at least one other country is steered from this location.

Number of international headquarters (companies with revenues >500 m EUR) per million inhabitants 2007

Rank	City	Thermometer value
1	Vienna	100.0
2	Ljubljana	45.8
3	Warsaw	19.2
4	Bucharest	16.8
5	Budapest	12.4
6	Moscow	10.9
7	Prague	10.3
8	Zagreb	5.2
9	Kyiv	4.5
10	Bratislava	0.0
CEE average		22.5

In CEE, only two cities have a significant proportion of large international headquarters. At the western end of the region, many companies choose Vienna as the base for their CEE headquarters. In Moscow, at the region's eastern extremity, many of the largest Russian companies and an increasing number of international enterprises direct their CIS activities from here.

The figures clearly show that market size and economic development seem to be among the main reasons that prompt international players to set up head offices in a given city. Vienna leads the ranking with 41 sets of headquarters, followed by Moscow (33), Bucharest and Warsaw (8 each). This picture changes, however, when these absolute numbers are set in relation to the population. Vienna retains its top spot, but is now followed by Ljubljana, a veritable economic powerhouse, and Warsaw. No large international headquarters are based in Bratislava, which is situated within the commuter belts of Vienna, Budapest and Prague. Kyiv, which boasts three sets of headquarters, occupies ninth place and competes with Moscow as the center of CIS operations.

Vienna, the top city on this score, benefits above all from its role as the CEE headquarters and as a strategic base for international organizations such as the UN, UNIDO, IAEA and OPEC. A Roland Berger study conducted in 2007 found that nearly half of all companies with operations in Central and Eastern Europe have their headquarters in Vienna – primarily for historical reasons. Of the Fortune 500 companies, 28 have their CEE headquarters in the Austrian capital. Today, however, decisions about where to locate are no longer determined by the availability of highly qualified managers. Rather, the key issues now are the tax and legal framework, close proximity to customers and access to a top-quality transportation infrastructure. On all these criteria, Vienna's competitors are mostly the new EU member states.

Vienna's key success factors are:

- > **Historical relatedness:** Austrian enterprises and firms have never cut their ties with Prague, Bratislava and Budapest. After the fall of the Iron Curtain 20 years ago, lots of Austrian companies were already on the ground in CEE at a time when, for many, enlargement of the EU was no more than a political vision.
- > **Proximity to customers:** Close geographic proximity to target markets in Central Europe is a decisive argument in favor of Vienna as a venue for CEE headquarters. Bratislava, Budapest, Prague, Ljubljana, Zagreb, Sarajevo, Belgrade and Berlin are all within one hour's flying time from Vienna. Warsaw, Berne, Brussels, Amsterdam, Paris, Rome, Tirana, Skopje, Sofia, Bucharest, Kyiv, Minsk, Vilnius and Riga can all be reached in two hours.

- > **Tax and legal framework:** According to the Austrian group taxation it is possible to use tax losses of foreign subsidiaries directly held by Austrian group companies. However, these losses have to be refunded at the time the foreign subsidiary earns profits against which the foreign loss carry-forward can be offset or leaves the tax group.
- > **Infrastructure:** As we saw in section infrastructure, a well prepared infrastructure is a pivotal success factor for business locations. Alongside public transport, healthcare and the level of ICT, office rents are crucial. On this score too, rents in Vienna are relatively low compared to those of Prague or Budapest, say.
- > **A high standard of living** is yet another important factor for international companies who are deciding where to base their regional headquarters.

Vienna is coming under increasing pressure, however, as other cities catch up. Especially in terms of education and the availability of highly qualified managers, Vienna's lead is shrinking. Following the sale of national air carrier Austrian Airlines to Germany's Lufthansa, the role of Vienna International Airport as the foremost CEE hub might be in danger too. Meanwhile, strict immigration and residency laws – not to mention the rise of xenophobia – are becoming a serious problem. For managers, tax rates too are fairly high.

To maintain Vienna's leading position, the city council established the Vienna Business Agency as its primary business promotion vehicle. The agency offers consulting services for entrepreneurs, startups and investors, including support in obtaining focused financial assistance; help in selecting, developing and acquiring appropriate sites; the construction and operation of advanced technology and startup centers; and assistance with networking and the organization of cooperative ventures throughout Austria and the EU region.

Foreign students

The Roland Berger KPI for foreign students measures the percentage of university students from abroad. Here again, Vienna is well ahead of its rivals with 22.3 percent of foreign students, followed by Prague (10.4 percent) and Moscow (6.6 percent). At the bottom of the table we can find Bucharest (0.8 percent), Warsaw (1.0 percent) and Kyiv (1.4 percent). In absolute figures, Moscow leads the ranking with 86,600 students, followed by Vienna (25,357) and Prague (14,024).

Vienna is very popular as place in which to study. After London, Paris and Barcelona, the Austrian capital already ranks fourth in the European ranking of university towns. On the downside, the fact that tuition is provided in German and Vienna's lack of an elite university detracts significantly from the city's attractiveness.

Percentage of students from other countries 2007

Rank	City	Thermometer value
1	Vienna	100.0
2	Prague	44.4
3	Moscow	26.7
4	Bratislava	20.5
5	Budapest	19.2
6	Ljubljana	9.5
7	Zagreb	2.8
8	Kyiv	2.4
9	Warsaw	0.9
10	Bucharest	0.0
CEE average		22.6

In 2007, about 40 percent of the foreign students in Vienna came from Germany. The second largest group came from Italy (11 percent). Of the latter group, however, more than 70 percent came from the German-speaking province of South Tyrol. In other words, about half of all foreign students in Vienna speak German as their first language. In addition, a significant number of students are the children of immigrants to Austria – mainly Bosnians, Turks and Serbs, as well as students from Central European countries (Poland, Slovakia and Hungary). More than three quarters of the foreign students in Vienna were EU citizens in 2007. About 90 percent came from Europe (including Russia and Turkey).

A study commissioned by the Austrian Academy of Science found out that, all in all, distance plays a central role when students opt for Vienna. Other important considerations are traditional migration paths, ethnic networks and historic ties between countries. Non-academic reasons also influence students' decision, especially the quality of life in Vienna and the city's attractive image. However, open spaces and sport and leisure facilities are generally regarded as less important. In the routine of daily life, the reserved mentality of the Viennese and a high level of xenophobia among the local population are perceived by foreign students as the biggest problems.

Prague, with more than 14,000 foreign students, ranked second on this score and is the favorite study venue for the majority of students in the Czech Republic. In 2008, a report co-sponsored by Prague's School of Economics found that the capital is students' preferred choice for a variety of reasons. These include better job opportunities, a livelier cultural and social scene, and the simple fact that more courses are offered here than elsewhere in the country.

Although specific local factors naturally have an influence, we were nevertheless able to identify four main success factors that make a city an attractive venue for international students:

- > **Attractive educational offerings:** Elite universities, English as the language of tuition and a wide range of courses lay the foundation for a successful study venue.
- > **Proximity to country of origin:** Students tend to study in cities that are culturally similar, have historical ties with their homes and offer a community of their own people. Cities can leverage these facts for marketing purposes.
- > **Extramural framework:** A good quality of life, broad range of cultural offerings and attractive job offers are important factors when choosing a place in which to study.
- > **Hospitality:** People in many CEE countries tend to be reserved toward foreigners. An open-minded local population that welcomes outsiders is therefore essential.

Foreigners

The Roland Berger KPI for foreigners reflects the percentage of people with foreign citizenship who live in a given city (non-students). Vienna once again leads the field with a 19.1 percent share of non-native residents, followed by Prague (10.8 percent) and Budapest (5.3 percent). All other cities have a non-native share of less than 4.5 percent. Virtually no foreigners live in Warsaw (0.3%) and Kyiv (0.7%).

Non-natives as a percentage of the population 2008

Rank	City	Thermometer value
1	Vienna	100.0
2	Prague	57.5
3	Budapest	27.2
4	Bratislava	22.9
5	Zagreb	18.3
6	Ljubljana	16.0
7	Bucharest	13.2
8	Moscow	13.1
9	Kyiv	2.2
10	Warsaw	0.0
CEE average		27.0

In 2007, about 318,000 immigrants lived in Vienna. The largest group was made up of natives of Serbia and Montenegro (23.9 percent of all foreigners), followed by Turks (12.3 percent), Germans and Poles (7.6 percent each). More than one quarter of all foreigners living in Vienna are EU citizens. Between now and 2035, the proportion of immigrants will rise to 28 percent. By then, the city will have a population of about two million. Immigration from traditional emigration countries such as Serbia or Turkey will tend to ebb in future as more people come from neighboring EU countries.

The partners and children of immigrants need residence permits if they too are to move to Vienna. Accordingly, the city cannot select new citizens based on

considerations such as professional knowledge and personal skills. To minimize integrational difficulties, the Vienna Business Agency seeks to attract potential immigrants from the CENTROPE region (Czech Republic, Slovakia and Hungary). This is because people from culturally very similar countries generally find integration easier than immigrants from very different countries.

At the same time (in 2007), about 130,000 foreigners lived in Prague. 36.1 percent came from Ukraine, followed by immigrants from Slovakia (13.9 percent) and Russia (10.2 percent). As in Vienna, most of Prague's immigrants too come from culturally similar countries. Unlike Austria, however, the Czech Republic does select immigrants in light of professional skills and market demand.

At the bottom end of the list, Warsaw has only 0.3 percent of foreigners. There are historical reasons for this very low figure. Until World War II, the city was a popular destination for internal and foreign immigration, especially from Central and Eastern Europe. Demographically, it was the most diverse city in Poland. As much as one fifth of its population was either Jewish or foreign-born. After World War II all that diversity was gone. Today's population growth derives primarily from internal migration and urbanization.

Binational marriages

The Roland Berger KPI for binational marriages describes the percentage of marriages between persons of different nationalities. This KPI reveals the extent to which a city works as a melting pot of the nations. It also says a lot about how well the various ethnic groups are able to integrate. Vienna wins on this criterion by a comfortable margin, boasting a binational marriage rate of 37.0 percent. It is followed by Bratislava (21.5 percent) and Prague (15.4 percent).

Share of binational marriages

Rank	City	Thermometer value
1	Vienna	100.0
2	Bratislava	51.7
3	Prague	32.7
4	Moscow	29.9
5	Warsaw	21.8
6	Kyiv	9.7
7	Zagreb	9.2
8	Budapest	0.0
	Bucharest	n.a.
	Ljubljana	n.a.
	CEE average	31.9

The example of Bratislava clearly shows that marriages between persons of culturally similar nationalities account for the largest share. Bratislava is very close to Slovakia's borders with the Czech Republic, Austria and Hungary. It is therefore not surprising that the largest share of "mixed marriages" is accounted for by Slovaks who marry Czechs, Hungarians or Austrians.

Standard of living

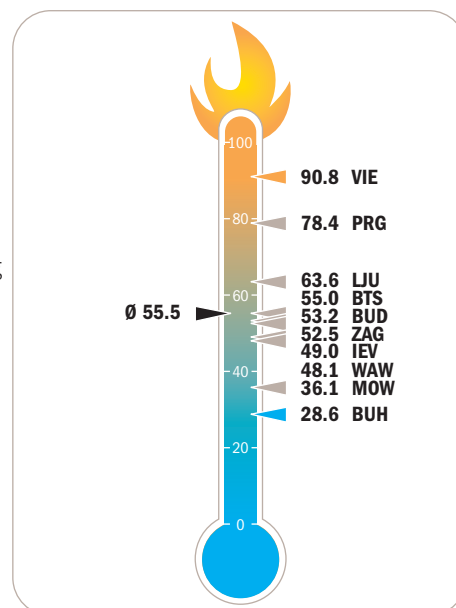
This chapter summarizes a variety of factors that make it enjoyable and/or convenient to live in a city and describe the local cost of living. Both aspects are crucial when people consider moving to a city or enterprises choose a new base for a subsidiary. The Overall Roland Berger City Standard of Living Index comprises four KPIs:

- > **Big Mac Index – Value of a Big Mac expressed in terms of working hours:** The less time an employee must work to earn enough to buy a Big Mac at local prices, the more attractive a city appears to people.
- > **Average rent – Average cost of housing per month:** Since housing absorbs a major share of people's income, the affordability of housing is a key requirement if people are to move to a city.
- > **Safety Index – Internal stability, crime and law enforcement:** Safety is naturally a crucial factor both for private individuals and for the corporate sector.
- > **Open spaces – Size of parks and local recreation areas:** The size and accessibility of open spaces gives people opportunity to relax and take exercise in the context of outdoor sporting and leisure pursuits.

Vienna is the winner of the Overall Roland Berger City Standard of Living Index, scoring 12.4 points more than Prague and 27.2 more than Ljubljana in second and third places respectively. Vienna comes top in both the Safety Index and the Big Mac Index, ranks second on average rents and occupies third place in the open spaces category. At the bottom of the table are Bucharest and Moscow.

Again, close analysis of Vienna as the top-ranking city enables us to identify certain critical success factors:

- > **Social partnership:** Austria in general and Vienna in particular regulates the labor market to guarantee reasonable wages/salaries.
- > **Real estate market regulation:** Vienna regulates and subsidizes the real estate market, thereby precluding unreasonable rent prices.
- > **Analysis of crime statistics:** Vienna constantly evaluates its crime statistics and carefully weighs up appropriate countermeasures.
- > **Separate department dedicated to forestry and open spaces:** Vienna actively cultivates its open spaces. A separate local government department is responsible for optimizing and coordinating the city's strategy in this area.



Standard of living – overall results

Big Mac Index

The Big Mac Index is published by UBS Wealth Management Research and was designed to facilitate comparison of purchasing power around the globe. It expresses the price of a Big Mac sold at a local McDonald's outlet divided by the weighted net hourly wage in 14 professions in a respective city. In other words, it gives an indication of how many minutes an employee must work to earn enough money to buy a Big Mac.

Big Mac Index (UBS) – Working minutes necessary to pay for a Big Mac

2006

Rank	City	Thermometer value
1	Vienna	100.0
2	Moscow	83.0
3	Ljubljana	64.2
4	Zagreb	58.5
5	Prague	56.6
6	Warsaw	49.1
7	Budapest	39.6
8	Bratislava	26.4
9	Kyiv	26.4
10	Bucharest	0.0
CEE average		50.4

Source: UBS

Remark: The Big Mac Index by UBS Wealth Management Research measures the price of a Big Mac divided by the weighted net hourly wage in 14 professions.

Vienna comes top in this category. Viennese employees must work for 16 minutes for one Big Mac. Moscow (25 minutes) comes second and Ljubljana (35 minutes) comes third. The worst performers are Bucharest, Kyiv and Bratislava where one Big Mac costs almost an hour's work.

Austria and its capital are well ahead of its peer group in terms of economic performance. Austria has been following the paradigm of the free market economy while the other countries and their capitals were communistic until the fall of the iron curtain. Compared to other European capitals, Vienna's Big Mac prices are roughly in the middle.

The income level cannot be maintained directly by the city government but framework conditions can be set. Austria has adhered to the principle of social partnership between employees' and employers' representatives (such as trade unions and chambers of commerce). These negotiating partners engage in collective bargaining to set minimum wages and salaries. This system is conducive to reasonable income for employees and social stability.

Average rent

This parameter describes the average cost of housing per month that an apartment-seeker would expect to pay on the open market. Our survey was based on apartments built after 1980 with three rooms, a kitchen and a bathroom. The calculated rent included incidental expenses but excluded garage costs. Other attributes of the apartments concerned included standard levels of comfort and convenience in the given locality and proximity to the city center. The average cost was adjusted in line with purchasing power parity to ensure comparable data.

Average cost of housing per month

2006

Rank	City	Thermometer value
1	Ljubljana	100.0
2	Vienna	91.7
3	Prague	91.0
4	Budapest	84.8
5	Zagreb	83.5
6	Bratislava	72.0
7	Warsaw	50.8
8	Kyiv	41.3
9	Bucharest	23.2
10	Moscow	0.0
CEE average		63.8

Source UBS

Remark: Average cost of housing per month, which an apartment-seeker would expect to pay on the free market (The survey was based on apartments built after 1980 with three rooms, a kitchen and a bathroom. The calculated rent included incidental expenses but excluded garage costs. Other attributes of the apartments concerned included standard levels of comfort and convenience in the given locality and proximity to the city center.)

The leader in this category is Ljubljana, followed by Vienna and Prague. Moscow is by far the most expensive city in absolute terms – and is even more expensive if purchasing power parity is taken into account.

In Vienna, tenancy law does not allow unreasonable prices to be charged for apartments. Although rent prices have been increasing in recent years, rents that substantially exceed the average for no justifiable reason (e.g. location or furnishings) are not permitted. Moreover, the Viennese government provides around 220,000 publicly owned apartments at favorable prices or grants subsidies to inhabitants with low income. Another major provider of apartments are confraternities supported by the Viennese government which offer rent adjusted to the income of the renter.

Safety index

This index is published by Mercer Consulting and is based on four criteria: a country's relationships with other countries, domestic stability, crime and law enforcement.

Safety index (Mercer)

2008

Rank	City	Thermometer value
1	Vienna	100.0
2	Ljubljana	88.7
3	Prague	85.1
4	Bratislava	84.3
5	Bucharest	72.9
6	Warsaw	69.2
7	Zagreb	68.5
8	Budapest	67.5
9	Kyiv	28.5
10	Moscow	0.0
CEE average		66.5

Source: Mercer

Remark: Mercer safety index is based on following criteria: Relationships with other countries, internal stability, crime & law enforcement

Vienna ranks first in this index among the CEE cities studied. Second place goes to Ljubljana, followed by Prague. The worst rankings are scored by Moscow and Kyiv.

Vienna recorded 214,691 cases of criminal activity in 2007, representing a modest year-on-year decline of 1.8 percent. At the same time, the city stepped up police presence, traffic supervision, closed circuit television surveillance, and artificial lighting in public garages, parks and pedestrian walks. Moreover, the city aims to apply existing laws more rigorously in cases where offenders are apprehended. Vienna constantly reviews its crime statistics and explores what can be done to avoid any deterioration in the current situation.

Open spaces

This KPI refers to the percentage of open spaces relative to the overall size of a city. Open spaces that are close to a city's boundaries or can easily be accessed by a city's inhabitants were not taken into consideration.

In this category, Kyiv achieved the best ranking. Fully 67 percent of the total city area are devoted to open spaces. Prague comes second with 54 percent and Vienna third with 48 percent.

Kyiv was founded in a picturesque area – on green hills on the banks of Dnieper river. Today, the city has many parks and green areas owing to the group of officials, who initiated the landscape gardening in the end of the XIXth century. For centuries, Kyiv's parks and gardens had remained neglected by the imperial government and only in 1887, the special gardening commission was created by local entrepreneurs and other influential citizens. Over the following decades, many of the parks and gardens were renovated, new ones were created. Later, after the end of the Civil War, Soviet government supported the initiative – the landscape gardening continued till the beginning of the World War II and even intensified after the end of the War.

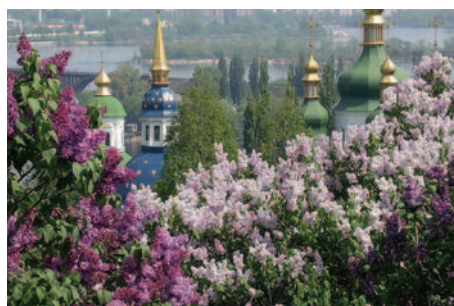
Size of parks and local recreation areas 2008

Rank	City	Thermometer value
1	Kyiv	100.0
2	Prague	80.4
3	Vienna	71.3
4	Moscow	61.3
5	Bratislava	37.4
6	Warsaw	22.9
7	Budapest	20.1
8	Bucharest	18.3
9	Ljubljana	1.4
10	Zagreb	0.0
CEE average		41.3

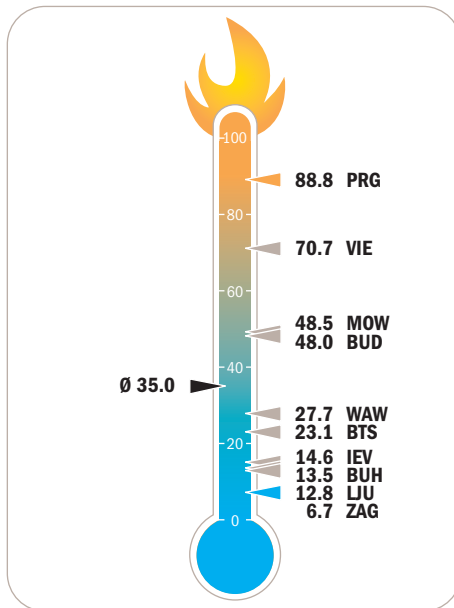
Currently, after some years of disregard during the first years of independence, the municipal government resumed the landscaping policy. In 2008, 18,000 trees, 63,000 bushes and 16 million flowers were planted in Kyiv by local authorities. In the beginning of 2009, the new program of redevelopment was accepted. It provides gardening of the new areas including the entrances to the city, and renovation of the existing parks and chestnut tree alleys – the traditional symbols of the city.

Kiev Botanical Gardens with
Vydubychi Monastery

The island of Hidropark on river
Dnieper



Culture



Culture – overall results

The overall Roland Berger City Culture Index consists of four KPIs. They summarize various cultural aspects based on the number of theaters, museums and concerts, plus the attractiveness to tourists of the cities we investigated:

- > **International concerts – Number of international rock band concerts:** This KPI shows a city's attractiveness for major entertainment events. The data was provided for 2007 through 2009
- > **Theaters – Number of theaters:** The number of theaters in a city reflects that city's reputation as a cultural center, as well as measuring the popularity of cultural events among the local population
- > **Museums – Number of museums:** The number of museums in a city give an insight into that city's historical significance, the relevance of modern culture and the city's sense of cultural heritage
- > **Tourists – Number of inbound tourists visiting the city per year:** The number of tourists who visit a given city per year illustrates that city's perceived attractiveness to citizens of other nationalities.

Overall, Prague comes top of Roland Berger Cultural Index with 88.8 points. The Czech capital was indeed first or second in all four measured categories. It is followed by Vienna, which has 70.7 points. Third and fourth places belong to Moscow with 48.5 and Budapest with 48.0 points. The bottom of the list is taken by Zagreb, with only 6.7 points.

International concerts

The number of concerts performed each year by international bands varies to a great extent. This study only counted well-known bands that enjoy worldwide recognition. Such events draw large numbers of (mostly younger) people into the host city from other cities and even neighboring countries. Concerts staged by famous bands bring prestige and recognition to a city and are important elements of the local nightlife.

Number of international rock band concerts 2007-2009

Rank	City	Thermometer value
1	Vienna	100.0
2	Prague	76.5
3	Bratislava	58.8
4	Budapest	58.8
5	Warsaw	35.3
6	Bucharest	23.5
7	Ljubljana	23.5
8	Moscow	23.5
9	Zagreb	11.8
10	Kyiv	0.0
	CEE average	41.2

For this study we counted concerts within the city area with 2 points and events in the commuter belt with one point. Vienna and Prague come top of this list, scoring 17 and 13 points respectively in the years 2007 through 2009. Budapest and Bratislava share third place with 10 points in the same period. At the other end of the table, Kyiv scored no points and Zagreb only two.

Theaters

The number of theaters available in the cities studied likewise varies considerably, and is heavily influenced by the type of financing. In Prague, for example, many theaters remain as a legacy of the Communist era. Back then, theaters and other cultural facilities were state-owned and therefore also state-financed. Although most of these organizations were transferred to private ownership in the 1990s, local governments continue to provide financial subsidies and grants. Many of Prague's theaters were indeed paid for by these generous grants. Gradually, these public contributions and grants are being reduced with the goal of making cultural venues financially self-sufficient. It is thus expected that the number of theaters will decline, as some will not be viable without financial support.

Number of theaters 2007

Rank	City	Thermometer value
1	Moscow	100.0
2	Prague	94.0
3	Vienna	41.7
4	Kyiv	26.2
5	Warsaw	17.9
6	Bucharest	15.5
7	Budapest	15.5
8	Bratislava	8.3
9	Ljubljana	2.4
10	Zagreb	0.0
CEE average		32.1

The city with the most theaters is Moscow (93), closely followed by Prague (88). In third place, Vienna trails at a considerable distance (44). Zagreb, Ljubljana and Bratislava are bottom of the list.

Bolshoi Theatre and
Bolshoi Ballet



Museums

The number of museums in a given city depends heavily on the support provided by national and local government, as well as on the attitude of the general public. CEE capitals are frequently visited by tourists and some museums depend to a large extent on tourist attendance levels. Budapest has more museums (85) than any of the other CEE capitals studied, followed by Prague and Vienna. Ljubljana is bottom of the list, below Zagreb.

Number of museums

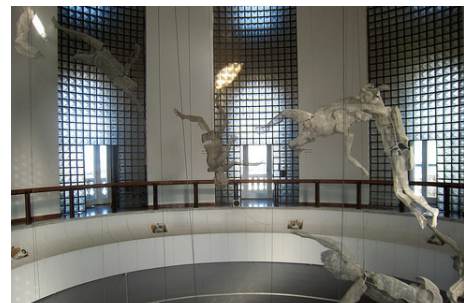
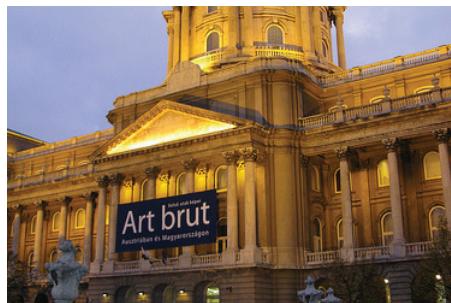
2007

Rank	City	Thermometer value
1	Budapest	100.0
2	Prague	84.5
3	Vienna	78.9
4	Moscow	70.4
5	Warsaw	52.1
6	Kyiv	32.4
7	Bucharest	12.7
8	Bratislava	7.0
9	Zagreb	2.8
10	Ljubljana	0.0
	CEE average	44.1

Tourists

Tourists tend to visit CEE cities predominantly on account of their historic interest. Some cities with large old town centers and many historic sites (such as Prague) can get tourists to stay for a number of nights. On the other hand, smaller cities such as Bratislava only attract visitors for a day or two. Cities in close proximity (such as Vienna and Bratislava) try to take advantage of untapped potential by encouraging people to visit both cities, thereby keeping in the region for longer.

Hungarian National Gallery



In the past, foreign visitors often had quality issues when visiting former Communist countries. In light of the number of upscale hotels built in the past few years, however, this is no longer a problem even though the variety of prices from low to high is not adequate yet in most cases. New issues such as pollution and traffic congestion have nevertheless arisen, and tend to discourage or annoy travelers to cities such as Moscow.

All in all, Prague is the most frequently visited city in the region, drawing over 11 million visitors a year, followed by Vienna with 10.1 million. Moscow (4.0 m) and Budapest (2.5 m) come third and fourth. On a per capita basis, the least attractive cities are Kyiv and Moscow, mainly due to the issues mentioned above.

Number of tourists visiting the city
2007

Rank	City	Thermometer value
1	Prague	100.0
2	Vienna	62.4
3	Ljubljana	25.5
4	Bratislava	18.0
5	Budapest	17.7
6	Zagreb	12.4
7	Warsaw	5.4
8	Bucharest	2.4
9	Moscow	0.2
10	Kyiv	0.0
	CEE average	24.4

Results and recommendations by city

Based on our analysis, this section highlights the main differences between the ten cities analyzed and reveals the relative advantages and disadvantages of each. The results and recommendations should be understood as markers for high-profile, attention-getting urban development projects rather than specific, fully integrated plans of action.

Bratislava (BTS)



Apollo bridge, Bratislava

Bratislava has scored seventh out of the ten analyzed Central and Eastern European cities. In none of the used sub-criteria, it was able to reach a leading position. Bratislava's challenge is certainly to get out of Vienna's slipstream and to develop an independent own city profile.

For quite some time, there have been announcements to integrate Bratislava, Vienna and Brno to an important European industry and technology location. However, concrete plans on necessary measures are difficult to find. Even a closer cooperation with the twin city Vienna improves slowly. The Twin City Liner and the common CENTROPE City and Valley urban development plans, at least, are good examples for integration.

Criterion	Rank
Infrastructure	6
Education	8
Innovation	9
Internationality	4
Standard of living	4
Culture	6
Overall	7

Bratislava has also profited from many of Slovakia's reforms in the last ten years. Nevertheless, the reforms of educational system and healthcare were not implemented and accordingly Bratislava suffered in these rating categories.

Despite the significant improvement in the last years, infrastructure has to be further developed.

After finishing the highway connection to Austria and establishing a connection to the European highway network, further highways, railroads and the city transportation networks need to be enhanced to satisfy rising demands. To be able to host major conferences and events, further specific infrastructure (e.g. high level hotels) needs to be noticeably developed.

Bucharest (BUH)



Fountains at Unirii Square, Bucharest

Bucharest came eighth out of the ten Central and Eastern European cities analyzed. Nevertheless, the city ranks first on two criteria: the number of tertiary education graduates and the length of the public transportation network (relative to the size of the city).

Bucharest's main problem is its poor infrastructure. There is an evident need for focused investments to significantly reduce inner-city travel times and, in particular, improve access to the airport. However, a wide range of relatively minor actions could enable Romania's capital to fully benefit from its existing infrastructure. With this goal in mind, Bucharest's newly elected local authorities recently initiated an extensive cooperation program with the traffic department of the city police.

Telecommunications suffer from the same problem. In the past, a relatively vague legal framework and the absence of strict controls led to a situation where a chaotic telecom network sprang up more or less at random around the city. Meanwhile, local authorities are tackling this issue, and an extensive 200 million euro project known as NetCity is in progress. NetCity will ultimately make Bucharest one of the first European capitals to have the whole of its telecom infrastructure based on an underground fiber optic network.

Criterion	Rank
Infrastructure	7
Education	6
Innovation	7
Internationality	8
Standard of living	10
Culture	8
Overall	8

Open spaces in urban areas have been reduced heavily over the last ten years as real estate projects were completed in parks and construction permits were granted all too easily. A clear urban plan should now make sure new constructions fit in with the existing architectural framework, thereby limiting anarchic growth. Moreover, more transparent planning for construction projects would be useful to combat corruption and illegal developments.

Finally, Bucharest has yet to implement a coherent integrated city master plan. Despite several ongoing projects, no consistent technological or touristic strategy has yet been defined.

Its tumultuous history provides Bucharest with huge touristic potential, both from an architectural and cultural point of view. However, the city fails to attract tourists at international level, and that for a number of reasons ranging from a lack of appropriate signage to a general neglect of touristic sites. Furthermore, poor city marketing currently undersells the city's inherent appeal.

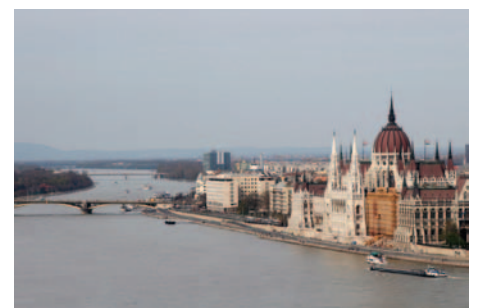
As a result, touristic potential is by no means exploited to the full. Recently, Bucharest's local authorities and the Romanian Ministry of Tourism therefore launched several projects to tackle these concerns. If their strategy works, Bucharest could soon become a more popular touristic destination in CEE.

Budapest (BUD)

Budapest came third out of the ten Central and Eastern European cities analyzed, securing a leading position in the region. Of all the criteria analyzed, Budapest ranks first in the number of business startups, the number of employees in creative industries and the number of museums. It clearly boasts a positive climate for entrepreneurship and creativity.

Potential for improvement exists in the following areas:

- > Establishing a strong, central City Council – Budapest has 23 "kerület" or districts, with its own municipal government each. To allow an adequate planning and development, there should be more central leadership for Budapest. That would ensure a concerted and sustainable development.



Budapest

Criterion	Rank
Infrastructure	3
Education	3
Innovation	2
Internationality	6
Standard of living	5
Culture	4
Overall	3

- > Implementing a leaner city management – A professional, almost profit-oriented investment management and city administration without party political influence is necessary to boost Budapest in international rankings.
- > Strengthening public transport – The city council should elaborate a long time development plan and ensure a better coordination between the different means of transport.
- > Fostering cultural tourism – There should be a strong brand for all cultural offers in Budapest.
- > Focusing on education and healthcare – Within a PPP development program, Budapest should strengthen its position in these essential areas.

Kyiv (IEV)



Kyiv

Kyiv came eighth out of the ten Central and Eastern European cities analyzed. The Ukrainian capital led the field on only one count: It has the largest percentage of open spaces relative to the size of the city, making Kyiv the greenest city in CEE.

Potential for improvement exists in the following areas:

- > Developing the transport infrastructure – This should be done both in the city itself (roads, engineering/environmental issues) and in the wider region (Kyiv's airport is the main gateway to Ukraine). It would make traveling to and around the city easier and faster, protect the environment and improve the quality of life.
- > Creating a customer service culture – This development is needed primarily in hotels and restaurants, but also in shops, etc., to bring Kyiv more into line with international standards and cultivate a customer-friendly atmosphere throughout the whole city.
- > Eliminating bureaucratic red tape – This is necessary on all levels – in the city council and in all public and governmental institutions – to streamline official procedures both for businesses and private individuals.
- > Raising a positive awareness of Kyiv – Internationally, a focused, long-term communication policy should position Kyiv as an attractive place to live, work and do business.
- > Modernizing and expanding cultural and entertainment facilities – Museums, parks, theaters, sports facilities and recreational centers are all in need of attention.

Criterion	Rank
Infrastructure	10
Education	7
Innovation	8
Internationality	10
Standard of living	7
Culture	7
Overall	9

Ljubljana (LUJ)

Ljubljana came fourth out of the ten Central and Eastern European cities analyzed. The Slovenian capital is the smallest of the CEE cities we examined, with a population of around 278,000. Ljubljana is a very relaxing city to live in, with a southern atmosphere and well frequented sidewalk cafés where people seem to have a lot of time to chat with their friends. The buildings and facades are excellently renovated which gives the city a very orderly touch.

But Ljubljana also occupies a leading position in terms of R&D spending and boasts the most affordable apartment rents relative to purchasing power.

Regarding the other criteria, the city commands an above-average position that gives it a strong overall positioning in the region. Ljubljana certainly has the potential to sharpen the focus of efforts to brand itself as a city and establish itself as a hub for Southeastern Europe, in defiance of the small size of the country. On the downside, the fact that public transport is limited to buses only results in significant traffic congestion at peak times. Worse, Ljubljana's railway connections to neighboring cities are as bad as Zagreb's.

Criterion	Rank
Infrastructure	4
Education	9
Innovation	1
Internationality	3
Standard of living	3
Culture	9
Overall	4

The Technology Park Ljubljana is currently helping 107 companies to develop from the startup to the internationalization phase and is a good example of how the city nurtures and develops high-tech innovation.



Old city center of Ljubljana

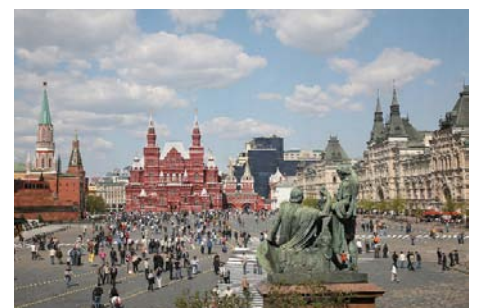
Moscow (MOW)

Moscow came fifth out of the ten Central and Eastern European cities analyzed. In the entire region, it scored top marks for the number of patents per million inhabitants, for the number of theaters and for the number of direct flights from its main airport. Moscow naturally occupies a unique position in the region. Since it is by far the biggest city and the capital of a huge country, it faces challenges different to the other cities. For expatriates, the Russian capital ranks as the most expensive city in the world. It also has the world's largest population of billionaires.

Potential for improvement exists in many areas. The city's basic infrastructure – especially roads, public transport and public buildings – must be upgraded to European standards. Housing quality too needs to be enhanced. Severe traffic congestion demands a strategy that finds genuine answers to current problems. Another obvious need is for affordable mid-range hotels that meet international standards.

Integrating the vast (and partly illegal) inflow of foreigners from the republics of the former Soviet Union poses a further major challenge to Moscow's urban developers.

Criterion	Rank
Infrastructure	5
Education	4
Innovation	6
Internationality	5
Standard of living	9
Culture	3
Overall	5



Red Square, Moscow

Prague (PRG)



Old city center of Prague

Prague came second out of the ten Central and Eastern European cities analyzed. This excellent position was achieved thanks to several criteria on which the Czech capital leads the region. Together with Warsaw and Vienna, Prague has the highest number of top-500 universities. It also has the largest number of secondary education graduates and of tourist overnight stays per inhabitant, as well as the greatest public transport system capacity per inhabitant.

All these facts give Prague a firm foundation on which to promote itself as a center of innovation and future development initiatives. The universities could adopt a more international outlook and should be linked into these innovation initiatives.

Criterion	Rank
Infrastructure	2
Education	2
Innovation	3
Internationality	2
Standard of living	2
Culture	1
Overall	2

Prague airport has the chance to develop into a regional hub and compete with the airport in Vienna. The city's administration still needs to be simplified and must go online wherever possible. At the same time, a service initiative is required to educate people about customer friendliness, especially in state/public functions. If a serious effort is made in this area, Prague could take a huge leap forward.

Vienna (VIE)



Secession building, Vienna

Vienna came top of the ten Central and Eastern European cities analyzed. It leads the region by a comfortable margin over the other cities in our study. Vienna won the rankings outright for the following criteria:

- > The largest share of binational marriages
- > The largest share of foreign students
- > The largest number of international headquarters per million inhabitants
- > The shortest work time needed to pay for a Big Mac
- > The safest city in the region
- > The largest number of concerts staged by international rock bands
- > The largest number of MRI units per million people
- > The highest household broadband penetration rate
- > The highest number of universities in the world's top 500 (together with Prague and Warsaw)
- > The highest availability of teachers
- > The highest share of foreigners

The main challenge to Vienna is clearly to defend and build on its obvious advantages. Activities should focus on improving the integration of foreigners. Given that almost one quarter of pupils in Vienna do not speak sufficient German in order to follow classes properly, this seems to be a pressing imperative. Also, the city could and should capitalize on its Twin city network

with Bratislava, but has yet to define common targets and benefits.

The Twin city region has not yet come up with common roadmaps for defined activities in the areas of science, research and tourism. Vienna still appears rather weak on research and education, although specific city marketing activities are moving in this direction. The number of business startups relative to the city population is low by CEE standards, which may partly be due to the fact that other cities in the region simply have so much catching up to do.

The number of patents is also rather small, as is the number of graduates from tertiary education.

Warsaw (WAW)

Warsaw came sixth out of the ten Central and Eastern European cities analyzed. It leads the region on only one criterion, namely the highest number of top-500 universities – an honor it shares with Prague and Vienna. Potential for improvement exists in the following areas:

- > International traffic/transport connections – There is a pressing need for a good road network to connect Warsaw to the rest of the country and Europe. As things stand, not a single highway leads out of the city. The number of airlines providing direct flight links to Warsaw could likewise be improved. Currently, direct routes are provided only by the Polish airlines and to major air traffic hubs. Although the railway network is adequate, the condition of the stations should be improved.
- > Public and private transport – Although one can get almost anywhere in the city by bus or tram without waiting long at a stop, dense traffic makes trips very long during peak hours. More must be done to make the public transport independent of private traffic (by expanding the subway, creating dedicated bus lanes, etc.). At the same time, drivers should be encouraged to leave their cars at home (by improving park and ride facilities and bicycle routes, say). Integrated traffic control systems are only now beginning to emerge at isolated locations. Cycle paths are missing. Roads remain bumpy and of poor quality. Moreover, the old tram systems running through residential areas are a source of noise and annoyance. There are too few bridges across the Vistula to accommodate heavy traffic.

Criterion	Rank
Infrastructure	1
Education	1
Innovation	4
Internationality	1
Standard of living	1
Culture	2
Overall	1

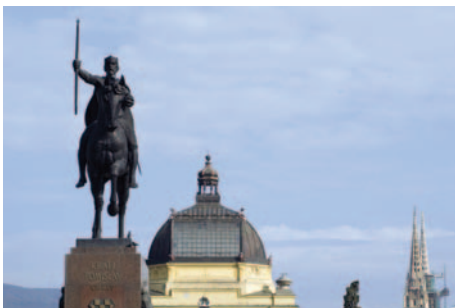


Old city of Warsaw

Criterion	Rank
Infrastructure	8
Education	5
Innovation	5
Internationality	7
Standard of living	8
Culture	5
Overall	6

- > (Coherent) Brand – Alongside the other necessary improvements, Warsaw needs to develop a promotion strategy to target domestic and international tourists and businessmen. Information centers and websites for inhabitants, foreigners and nationals should be created to promote existing events and communicate a coherent marketing image of Warsaw. Also, Warsaw lacks a clear landmark as an icon that people associate with the city. This is not because of a lack of suitable landmarks, but because the city's strategy is unfocused. Warsaw also lacks large venues for cultural and sporting events, including public amenities. Large new venues should be built to attract and accommodate the large-scale sporting and cultural events that are currently staged in other cities in Poland and other CEE countries. Although Warsaw has plenty of greenery lining its streets, there are few large parks and public recreational areas as such. Large open spaces and sports facilities must be created to improve the standard of living.
- > Hospitality programs – Support for the expatriates living in Warsaw should be improved. Childcare, education and senior citizens' care facilities for foreigners are in short supply. Polish labor immigration rules should be simplified; and the clerks at public offices should improve their foreign language skills.
- > Architectural strategy – The center of Warsaw is an apparently unplanned mix of modern architecture, Communist-era constructions and pre-War buildings. There is also a confusing mixture of residential and business locations. Social facilities such as kindergartens and cultural centers are too scarce for a city of this size, and the authorities do not oblige developers to plan such facilities when developing residential projects. Shopping and entertainment areas are scattered throughout the city, making it difficult for people to organize free time efficiently. The city should do more to promote the creation of dedicated areas. Moreover, agricultural and recreational plots still exist near the center of Warsaw that do not fit in with the overall urban landscape.

Zagreb (ZAG)



King Tomislav statue, Zagreb

Zagreb came bottom of the list of the cities we analyzed. The Croatian capital did not achieve leading positions on any of the criteria we examined unfortunately.

One of the city's strengths is the scope of its public transport network relative to the size of the city. On this score, Zagreb ranks second in the entire CEE region.

On the other hand, Zagreb has the lowest number of people with tertiary education, a very low number of employees in creative industries, almost no international company headquarters, the smallest proportion of open spaces relative to the size of the city, one of the lowest numbers of theaters and museums, and very poor direct connections from Pleso airport.

To improve its international positioning, the quality of life for residents and the city's attractiveness to businesses and tourists, Zagreb must address a number of issues at same time.

Zagreb is not really linked into international tourist itineraries. The city, especially the old parts, are neither prepared nor fitted out to accommodate tourism. Nor is its historical core presented in a way that would appeal tourists. A master plan is missing.

As far as its infrastructure is concerned, Zagreb airport is in urgent need of modernization. A rail link between the airport and the city is missing; and rail services to neighboring capitals such as Ljubljana, Vienna, Belgrade and Budapest are suboptimal. From the perspective of foreign visitors, another important consideration is the need to clean up the city's ubiquitous graffiti. Air quality too must be improved as a matter of urgency.

As things stand, the public transport system does not take precedence within the overall traffic and transport system. Although some action has been taken to remedy this situation (e.g. the replacement of most of the aging trams and the renewal of the city bus fleet), there has not yet been a shift toward public transport as the preferred mode of transport. A master plan should give precedence to public transport (trams, buses, taxis and bicycles), promote the development and use of cycle paths, step up the frequency of public transport services, and consider the construction of two subway lines. On the business front, the city lacks initiatives to attract international companies to establish regional hubs here.

The City of Zagreb and Zagreb Holding are facing a downgrade of their ratings due to a difficult liquidity and profitability situation. The stand-alone creditworthiness of both entities is weakening due to deterioration in the operating environment. This factor is a cause for concern, as a healthy budget is needed to finance future development.

Zagreb has a weak position in cultural offerings and in the field of R&D and innovation. We believe that it is urgent for the city of Zagreb to bundle its long term ambitions in an overall city master plan.

Criterion	Rank
Infrastructure	9
Education	10
Innovation	10
Internationality	9
Standard of living	6
Culture	10
Overall	10

Study methodology and authors

The complexity of this study derives from the fact that no single data source was valid for all the cities analyzed in this study. Accordingly, a wide variety of statistical data had to be gathered from national and international sources such as national statistical offices, local government offices and regional institutions, in addition to rankings published by the Swiss bank UBS and Mercer Management Consulting, an international consulting firm. Roland Berger Strategy Consultants also performed its own analyses in cases where none of the other sources delivered sufficient data quality. Each Roland Berger Key Performance Indicator (KPI) was defined as narrowly as possible to ensure that the data used was both up to date and readily comparable across all the cities investigated.

The final ranking is a composite score derived from 24 Roland Berger KPIs (four for each of the six categories: infrastructure, education, internationality, innovation, standard of living and culture) and for overall "performance". To keep the data readily comparable, a thermometer system was used for individual criteria. 100 points on the thermometer indicate the best value and 0 points the worst value for each of the selected KPIs. Per category, the average number of points of these thermometers was calculated in order to identify the category winner. Finally, the average score of the six overall category results was calculated to determine the overall winner.

This study is intended to provide recommendations as individual cities seek to grow, develop and add value.

Dr. Vladimir Preveden
Managing Partner
Zagreb



Konrad Kreid
Senior Consultant
Vienna



Matthias Sturm
Senior Marketing Advisor
Vienna



Monika Lysá
CEE Researcher
Prague



Stefan Baumgartner
Consultant
Vienna



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