

Smart solutions for a new building complex in the Tornakalns district - Riga

The Tornakalns complex is a large-scale neighbourhood that is currently being planned and constructed in Riga's existing Tornakalns district (see Figure 9). The initiative derives from wider plans to develop a new city centre, the Pārdaugava centre. It is also a result of long term discussions on the concept and location of a new administrative centre for the city, which will now be established as part of the new complex.

The complex will consist of a combination of buildings, transport infrastructure and public spaces. As an integrated project, it will feature different functions, including Riga's Administrative Centre, the Academic Centre for the University of Latvia, housing, schools, workplaces, recreational and shopping areas, as well as transport services. Parts of the complex will take the form of a 'slow movement' area, with different services located at a walking distance from each other. The overall area is 46 ha, with a total of 665,000m² of newly constructed buildings.

Parts of the complex are already under construction, including the Academic Centre of the University of Latvia; this includes a number of buildings housing different academic departments, institutes and national research centres.



Construction of The National Library (See Figure 10) is fully completed and the surrounding infrastructure improved, including adding cycle tracks and pedestrian lanes on the main roads along the river Daugava.

Low energy consumption is central to the development of the Tornakalns complex, and new technologies are planned to contribute to this. Territorial improvements and well-functioning transport flows are other key goals; this will be met in part by a new multimodal transport junction, with a new railway station, bus terminal, tramway line and cycling tracks.

The Tornakalns project is designed to help meet the city's overall strategic 2030 goal; to create energy efficient, resident-friendly and modern neighbourhoods. Reduced traffic flow in the city centre is part of this, with neighbourhoods situated close to the centre being used more intensively.

The sections below set out how the initiative fulfils the key European Commission and STEP UP lighthouse criteria.

Integration of energy, ICT and transport

Energy

According to the development plans, the contribution towards the city's overall 2030 strategic goals will be made in a variety of ways, including:

Heating, cooling and ventilation: energy for heating, ventilation and cooling will be supplied by a district heating system. Ground heat will be integrated into heating and cooling systems, with bearing poles functioning as thermoprobes for the heat pumps. Air conditioning equipment is planned to include heat and humidity retrieval.

Water: accumulation devices will be installed for collecting rainwater, which can then be used to water green spaces. Hot water supply will be managed using solar collectors.

Lighting: since approximately 35-50% of the power consumed in buildings of the type being constructed is typically used for lighting, this will be provided by luminescent lamps, energy efficient lamps and LED diodes. Furthermore, outdoor lighting will be powered using renewable energy resources such as wind rotors and solar batteries, with reserve connections to the grid.

ICT

New technologies will be used to achieve the best possible conditions for energy efficiency, territorial improvements and better transport flows, as well to maintain the buildings to meet the needs of residents and visitors to the city. As the complex is still being planned, a number of ICT elements are still in development. However, the academic centre, which is already being built, provides some examples.

Power network control system: efficient functioning of the electrical power network within the academic centre will be achieved by implementing a network control system integrated with a lighting control system. The network control system will feature the following functions:

- Night mode - after classes, vacant areas will be transferred to night mode, with all power consuming devices which are not required switched off automatically. Devices that need continuous power supply will be left on.

- Safety and control – the simplified identification of damage and timely prevention of accidents will be enabled, as well as the capability to observe other existing processes.
- Manual control - the system user can adjust the system to his or her own needs.
- Protection against black-outs - in case of an emergency black-out the system is automatically transferred to alternative power sources (for example, UPS, diesel-operated generator or reserve input).

Automatic lighting control: lighting devices will be controlled from a multifunctional monitoring system which will provide energy efficient lighting to all premises, and include measures for maximising the use of daylight, recording the presence or absence of people on the premises, zoning for required intensity and night mode functions.

Transport

The development of the complex is aligned with the strategic 2030 development goal of Riga; that the city is to become friendly to pedestrians, cyclists and public transport.

Integration of transport and mobility: the complex will integrate transport infrastructure with new buildings and public spaces. Parts of the complex will have the feel of a 'micro town' with all the functionalities of a town: housing, schools and workplaces, recreational and shopping areas and transport services. The micro town will have a 'slow movement' area with all functional zones located at a walking distance from each other.

Connections to the rest of the city: solutions will not only take into account the needs of the specific neighbourhood, but also the nature of all transport flows in the district of Pārdaugava, where the Torņakalns complex is situated, as well as the need to reduce traffic congestion in the historical city centre. The new railway station and bus terminal will reduce public transport flow on the right-hand side of the nearby Daugava River, and will provide a fast and simple transfer to the city centre.

Multimodal transport junction: the complex will include a new multimodal transport junction with a new railway station and bus terminal, as well as a new tramway line and cycling tracks. This will encourage users of, and visitors to, the area to use alternative modes of transport to private cars.

Replication and scalability

The Torņakalns complex is designed to address a challenge that is common in many European cities: how dense and multi-functional neighbourhoods can be established on vacant city centre land, in a way that results in increased public transport and energy efficiency. There are other examples of such initiatives elsewhere in Europe, such as Kvillebäcken in Gothenburg (see section 4.3.2), which creates opportunities for such initiatives to learn from each other. However, initiatives such as these, which consist of many parts and actors, are always based on local circumstances and therefore take various forms.

What is characteristic of the Torņakalns complex is that it is centred around the establishment of a new City Administrative Centre and agglomeration of university buildings, that it uses an existing railway line as a multimodal transport junction rather than keeping it as a barrier that separates different city parts, and that the area is formed as a micro town which provides not just one, but many, functionalities.

Replicating the whole concept of the Torņakalns complex would not be possible for most European cities, but many parts of it could be. This is also shown from the fact that the Torņakalns initiative has learned from other initiatives, such as Stratford City in London and Rapid City in York, in terms of how a centre can be spread out on both sides of an existing railway line without these lines potentially isolating the different parts of the scheme.

When it comes to the complex's potential for being scaled up, there are certain aspects of the initiative that are well suited to other parts of a city, for example the establishment of multi-functional neighbourhoods. Some of the technology solutions for decreasing energy consumption could also be implemented in other districts and thereby have effects on a wider scale. In addition, the transport solutions already take into account transport flows and congestion across the wider city; which implies that the new transport junction will certainly have effects on the city's wider transport system.

Integrated building blocks

Planning started in 2004, with discussions concerning the new administrative centre in Riga. The idea that the initiative should integrate different building blocks in this way arose during the planning process. The discussions have since then evolved and become more concrete, with new building blocks added to the plans. These

plans are now being implemented: parts of the complex are already being built and other parts are at the planning stage and will be built further on.

The complex will be made up of a number of buildings that have been designed as separate unique constructions; however, spatially they will create a single complex.

These include:

- Riga City administrative buildings (58,000m²);
- Office buildings (265,000m²);
- Residential buildings (225,000m²);
- Commercial buildings (60,000m²); and
- Recreational buildings (6,000m²).

The Academic Centre of the University of Latvia, one of the first buildings to be constructed, includes a number of buildings offering a comfortable, functional and economic learning, work and living environment oriented towards sustainable development. The centre includes different parts: the Academic Centre for Life Sciences (which will be completed in 2015), two institutes (the Institute for Microbiology and Biotechnology and the Institute for Chemical Physics), as well as six national research centres which focus on everything from environment resource acquisition and sustainable utilisation technologies to public health and clinical medicine.

Transport infrastructure is another important building block in the complex. The micro town nature means that a network of roads will connect the different functions of the complex, and these functions will be accessible by foot, bicycle and public transport. The new railway station and bus terminal will provide a fast and simple transfer to other areas in the city, and the existing railway line will be developed so that its barrier effect is reduced as much as possible.

Public spaces and outdoor environments are another building block. An urban recreational area is planned within the Kīleveina Grāvis area, aiming to create a well-adapted and comfortable space for people of different age groups and varied interests, friendly to the existing ecosystem and adapted to the existing urban environment. The buildings of the Academic Centre of the University of Latvia will be located around a square, which will be the representative public outdoor space of the

University. Other initiatives will create green outdoor environments; the Academic Centre for Life Sciences will have an external design which shows an affinity to nature, with a green five-leaf akebia vine growing on the central façade to mitigate the effect of excessive solar heat in the summer and frost in the winter, succulent plants grown on the roof and crops planted in the yard.

Monitoring and reporting

A research study on the technical and economic justifications for the redevelopment of brownfield sites in the Torņakalns district was conducted in 2009, forecasting a number of benefits from the development.¹ These include productivity growth and improvement in educational quality, cost-saving benefits expected from the relocation and merging of the university, and additional employment. Furthermore, the project is expected to contribute to reduced environmental pollution in the area. The expected energy savings from the project are 50-70% compared to areas of a similar scale that are built in a traditional way.

Key winning elements of success

Political leadership with a long term approach

Long term political support has been key to work on the Torņakalns complex to date, with the historical roots of the initiative starting when the concept and location of a new administrative centre for the city of Riga was discussed over 10 years ago. In 2006 an international architectural competition was held, supported by Riga City Council, for which 17 proposals were submitted. Five proposals were rewarded, with the British company Fletcher Priest Architects winning the competition. Their design is being integrated in the spatial plan of the territory, linked to the Torņakalns Administrative Centre. The idea of a compact and energy efficient neighbourhood is also supported by Riga's wider political strategies, and the initiative is directly linked to Riga's development strategy of becoming a smart and sustainable city with an emphasis on socially responsible, sustainable, smart and compact urban development. The development also contributes to Riga's SEAP targets.

Collaboration and dialogue with all stakeholders

Political leadership has played a central role in the initiative, which has been made possible as a result of initial plans for an administrative centre for the city. In addition, the university is closely involved with the development of the complex, and it is likely

¹ www.sus.lv/sites/default/files/media/faili/tornakalnstep_final_30122009.pdf

that this research and teaching establishment has been an important catalyst for the project.

Various other stakeholders have also been involved, including through a management and marketing committee (established in 2008) with 22 members from stakeholder organisations. Each organisation represented a particular area, and the committee enabled stakeholders to harmonise projects and decisions, create ideas and find the best solutions. Citizens have also been engaged through an exhibition of the projects for all Riga residents and a four week public consultation.

Business models to attract investment

The administrative centre and the university campus are two examples of how the Torņakalns complex has been made possible by building on existing initiatives of strategic interest. The first stage of the initiative, which focuses on the establishment of the university buildings and their equipment, is partly financed by the European Regional Development Fund and partly by Latvian governmental organisations. The public tender is at this stage not to exceed €22.45 million (excluding VAT), divided as follows: €19.15 million of funding from the European Regional Development Fund, €1.49 million of government funding and €1.79 million of funding from the University of Latvia. The infrastructure and roads will at this stage be financed by municipal funds.

Decisions have not yet been made on what business models will be used for future stages of the project. However, the 2009 research study on the technical and economic justifications for the redevelopment of the Torņakalns district presented four alternatives for action: 1) that no project would be developed at all; 2) that the area would only consist of commercial constructions and that the territory would therefore be rented to private developers; 3) that only public constructions would be developed in the area; and 4) that it would contain public as well as commercial facilities. The study suggested developing the area through a public and private partnership (PPP).² This is now being considered as an option going forward.

Promotion of the initiative

Until 2006 the promotion of the project focused mostly on the national and local level in order to solve land ownership questions during the early planning stage. After this the initiative was promoted on municipal, urban development and planning levels, including to professionals, experts and relevant organisations. Riga City's Architect's

² www.sus.lv/sites/default/files/media/faili/tornakalnstep_final_30122009.pdf

Office played an important role in promotion, working in close cooperation with Riga City Council Departments.

Furthermore, the international architectural competition (2006-2007) also played an important part in the promotion of the initiative. The winner of the competition, Fletcher Priest Architects, has promoted the initiative on an international level, including at the 2008 London Architecture festival. The initiative has also received a variety of local and international media coverage.³

³ Examples of media coverage: [Open Buildings - New Urban Centre, Riga July 2011](#); [Building April 2010](#); [4AD July 2009](#); [Riga Dienas February 2009](#); [Ingatlan Magazin February 2009](#); [Urbanism.org February 2009](#); [Diena Riga February 2009](#); [World Architecture News February 2009](#); [LvArhit December 2008](#); [Architecture - Riga December 2007](#); [Architecture - Riga December 2007](#); [e-Architect December 2007](#); [Design Build Network November 2007](#); [Riga City Council October 2007](#); [Europaconcorsi September 2007](#); [Building Design September 2007](#); [Riga City Council September 2007](#)

