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intelligent build and design innovations

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Creating the building blocks for forward-looking design

THE NEXT REGENERATION:
SOM pursues sustainable
development in Eastern Europe

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Aerial view of the Bratislava Pribinova development

CREATING SUSTAINABLE DEVELOPMENTS IS the greatest design challenge of the twenty-first century. While urban regeneration has succeeded in re-adapting an environment strongly shaped by the industrial economic model, it has often produced uniformity, concentration of single uses and gaps between past, present and future. The Bruntland Commission (1987) defined sustainable development as: 'development that meets the

needs of the present without compromising the ability of future generations to meet their own needs'.

What is needed is a more integrated approach, allowing for a greater flexibility and integration of uses, an approach that is responsive to changes in the world's economies. A sustainable urban model is more responsive to the balance needed between economic performance, environmental impact and social

needs. This implies a design process integrating the requirements and conditions for economic, social and environmental success. The outcome of such an approach is a successful model that is as rewarding for the end users, in terms of delivering a better place to live, work and play, as it is for the developers and public authorities.

Where all three areas are subject to major shifts, drivers of change can be even more radical. The manner in

Michel Mossessian, an associate director in Skidmore Owings & Merrill's London office, tracks the progress of sustainable development in urban regeneration projects, and finds plenty of reasons to be optimistic for the future.

Towards sustainable regeneration

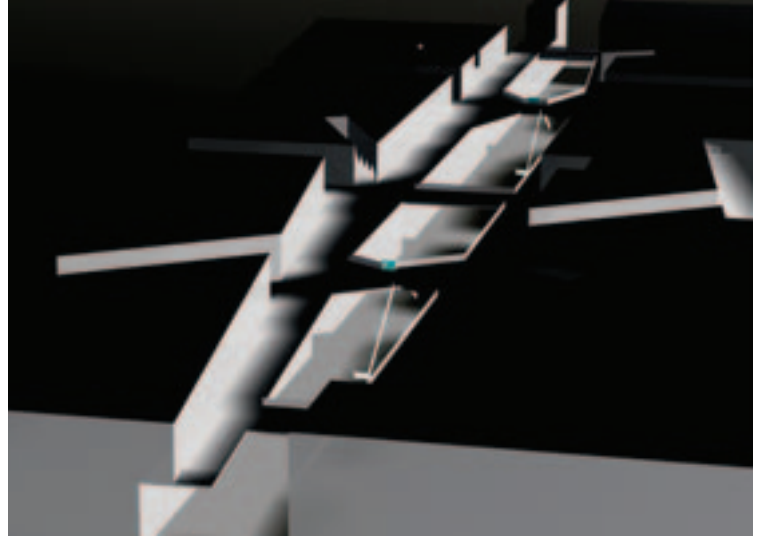
(Right) conceptual model: urban slices;
(bottom) conceptual model: urban flows on retail covered street

which the Eastern European countries have developed since the early 1990s has created unexpected opportunities for bringing East and West closer together, and for defining a new economic paradigm.

We can learn a lot from the Eastern European design ethos, which is characterised by higher end-user comfort regulations and a strong desire to produce unique and attractive environments. The countries in the region are eager to produce a new model, but also to embrace a market-driven approach, combined with a strong desire to build on the social achievements of the twentieth century and revive their historical and patrimonial assets.

Architects, planners and engineers are torn between a variety of interests, including clients, city officials and market consultants, and they must respond to increasingly ambitious and sophisticated briefs during the design process. Faced with the many different social, economic and environmental parameters inherent in a given brief, only a collaborative team can grasp the benefits of technology and develop a clear understanding of public policies from an early stage in the design process.

A more holistic approach will respond to existing opportunities, with a view to achieving better ways of living, working and playing. This drives all the participants towards a common goal – sustainable development – and challenges them to develop new design models.



Seizing the opportunity

The Pribinova master plan in Bratislava, Slovakia represents a major step towards sustainable regeneration. The brief called on Skidmore Owings & Merrill (SOM) to provide a 200,000m² mixed-use retail-led development along the banks of the Danube, to the south-east of the existing city centre of Bratislava. The client, Ballymore, Properties, supported our initial approach that the master plan should demonstrate a sustainable extension of the city fabric, both in design and economic terms. The study encompassed surveys of the city's housing, retail space and offices, and sought to project future demand. The detailed development of the brief, concept and phasing progressed in parallel with these studies, and was further refined by

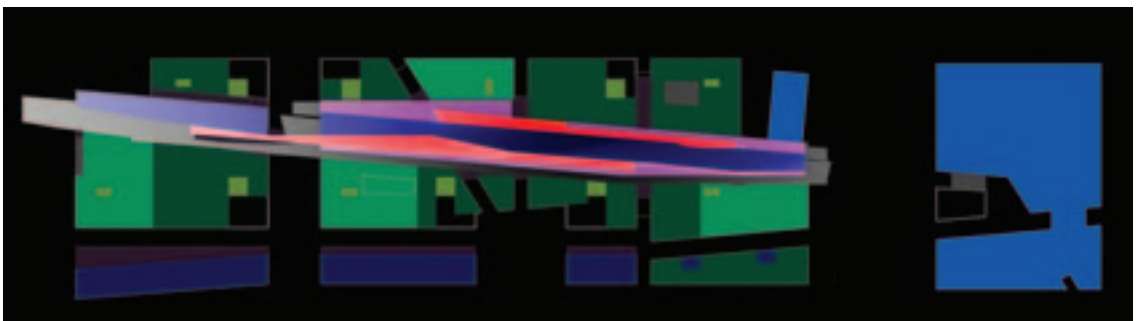
bringing on board retail specialists and letting agents.

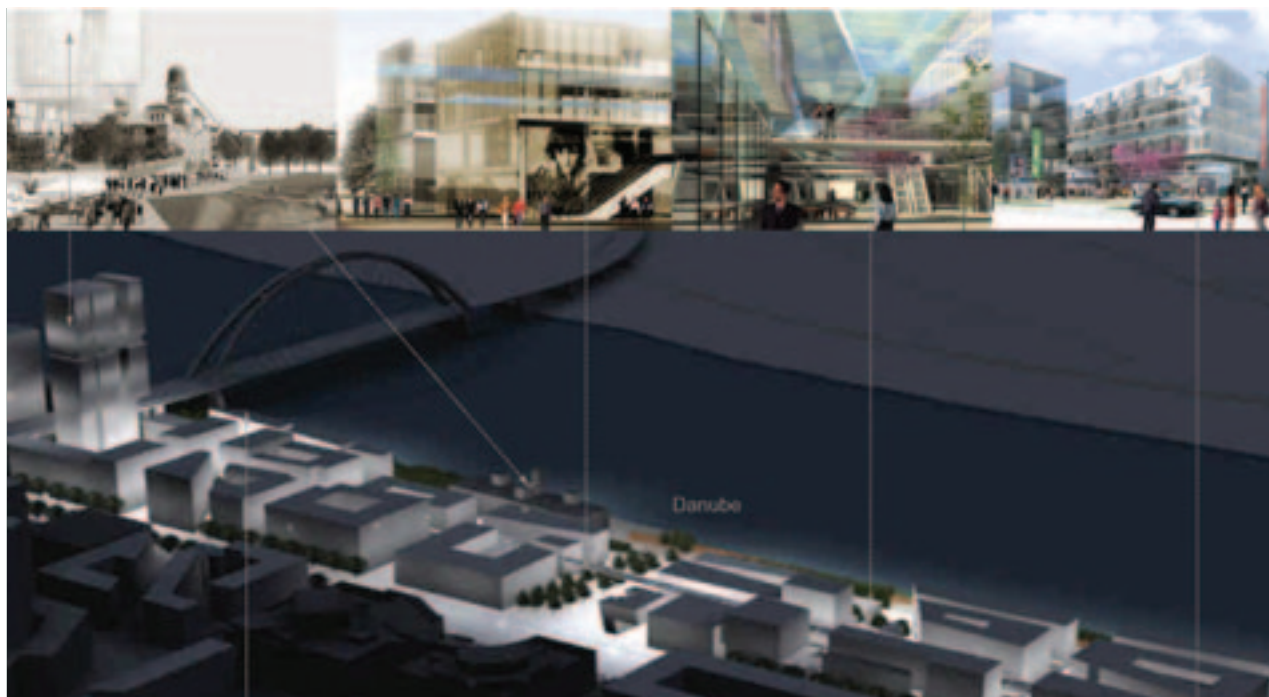
The first challenge was to interpret the commercial brief and reconcile it with the original master plan approved under the communist regime. This in turn created an opportunity to combine the original master plan with a move towards a sustainable urban design framework.

In an attempt to reconcile elements that at first appeared to be incompatible, SOM developed a series of themes that would gauge the ambitions of the client and the public authorities, and guide them away from simple compliance with the previous plan.

Continuity and innovation

The city of Bratislava has in the past ten years undertaken a major





Mixed-use master plan (axonometric view) showing residential development on the riverfront, covered retail galleria linking the urban blocks and office buildings on Pribinova Boulevard

transformation and rejuvenation of its central historical district. The effort has clearly revived interest in the classic European townscape of plazas, pedestrian routes and public parks, and the opportunity to link and extend the city centre to the east could not be passed up.

The architectural legacy of dense urban patterns and fabric has been embraced by city officials in most European cities. Tourism represents a major source of revenue, and the public authorities do their utmost to showcase the best their city has to offer and to project an image of friendly conviviality.

The proposed density matches that of the existing city centre, and was a conscious attempt to create a new mixed-use district that ties in with the existing urban grain. Great care has been taken to extend the fabric of the city towards the river.

The idea of developing blocks with streets leading to the river supports the notion of open, democratic access to a public resource.

By extending vistas beyond the existing city fabric and across physical barriers (urban highways), the plan becomes broadly inclusive rather than exclusive.

Historically, the former Eastern Bloc countries adopted principles of zoning, which were considered the best practice for urban planning in the 1940s, 1950s and 1960s. This resulted in the separation of housing and industrial uses. Today, apart from when working in heavy industry, most urban designers eschew the principles of simplified zoning adopted by planners in the past, instead favouring mixed-use and self-sufficient neighbourhoods that look to recreate the vitality of the traditional European city. The fall of communism has led to a stream of investment capital flowing into Bratislava, encouraging designers to bring fresh ideas to the table that explore concepts of urban regeneration and sustainability.

Mixed use and critical mass

The plan provides space for

186,000m² (2,000,000ft²) of retail, leisure, office and residential development, featuring a riverfront park, pedestrian-friendly streets and a major new public square. The project restores the waterfront and transforms a previously industrial water-side area into a sustainable urban district with good transport links.

The brief calls for a market-driven approach, and consequently puts the commercial agent's requirements in the foreground. Mediation becomes of paramount importance, and a sustainable design approach provides enough resources to ensure the coherence of the whole. Consequently, the whole is greater than the sum of its parts.

Agents have specific requirements, and each agent operating in a particular sector can easily come into conflict with other uses. For example, retail agents demand maximum control and specific rules in order to 'capture' the shopper's routes. They also require a minimum area, specific mix, systematic space planning and

View from the covered galleria



plenty of parking. The logical outcome is a shopping mall.

Office agents, on the other hand, demand flexibility, a proprietary address and image, consistent floor plates and international-standard specifications. The use and abuse of the latter often results in conventional building types with traditional mechanical systems and high energy consumption.

These traditional systems do not deliver construction cost savings compared with systems using natural ventilation and cooling water systems, nor can they compete with alternative systems based on life cycle cost-saving strategies. They are typically specified on the basis that prospective clients know what they are getting.

By way of contrast, residential agents prize fine views, exposure to the sun and good parking, and tend to eschew mixed-use developments.

Observing agents' requirements can easily lead to zoned or enclaved projects, making a mixed-use development more problematic but still possible. SOM's challenge was to fulfil all of the agents' requirements while maintaining a dense urban grain, juxtaposed with a mixed-use programme, on a continuous and seamless flow of streets, boulevard, covered galleria, plaza and riverfront park.

Our multidisciplinary design team set about adapting the initial master plan step by step by sizing the buildings to an appropriate lease span, calibrating the streets and passages for pedestrian and vehicular use, and dimensioning the open and public spaces.

The final proposal was for a high-street retail galleria that would link together the various office blocks, help to create a new boulevard on Pribinova and give each block its

own distinct corporate address. In this way, the residential components would benefit from facing south and from the views of the river and the newly created riverfront park.

Compact cities and neighbourhoods are efficient models of sustainable design, as they reduce reliance on transportation and the associated evils of fossil fuel consumption, pollution and congestion. With its excellent transport links, the site is uniquely suitable for the planned high-density retail/commercial/residential mixed use.

By regulating the depth of these structures to 15–18m, SOM is adopting current local regulations for the natural daylighting of offices as well as working with a dimension that is also adaptable to housing requirements, thus further supporting the scheme's sustainable credentials.

Meeting daylight requirements

As the design vision of the revised master plan achieved compliance with the commercial brief and received the endorsement of the mayor and the city planners, a few concerns emerged, necessitating further adjustments.

First, there were the Slovakian regulations on internal daylight requirements for working and living. At the start of the pre-scheme design stage, a code analysis was prepared to identify the major requirements in terms of local Slovakian building regulations and standards that would influence the design of the scheme.

While studying the precise requirements for daylighting in offices, it





Covered galleria linking all the urban blocks and public spaces

became clear, given the complexity of the initial massing of buildings and the associated variety of aspects and orientation, that the local practice of applying rule-of-thumb tests to a 'box' would be difficult to achieve and unlikely to generate a verifiable map of daylight factor distributions.

The local requirements prescribe an average daylight factor of 3 per cent and a minimum of 1.5 per cent of overcast sky conditions for permanently occupied workspaces. Mixed light is acceptable only for temporary occupation, where daylight factors of between 0.5 per cent and 1.5 per cent are the norm.

At this point environmental consultants Battle McCarthy began a detailed series of daylighting model studies. The massing that was initially used for selected office buildings was a block structure with internal central lightwell/atrium. However, this arrangement was quickly ruled out after the first test runs, as daylight factors proved to be unsatisfactory for most of the floor plate.

These results informed the revisions to the massing of the office blocks, and the design was rationalised narrow slab and L-shaped structures with 18m wide floor plates and a minimum 50 per cent glazed area. These were found to have excellent levels of daylight penetra-

tion up to a notional corridor for an open plan configuration, and thus could be considered as permanent workspaces in accordance with Slovakian regulations.

For a cellularised configuration, the daylighting penetration was slightly less favourable, with more mixed-light conditions, resulting in a higher proportion of workspaces being designated as suitable only for temporary use.

Wind and natural ventilation

Another concern was how winter winds would affect the comfort of pedestrians within the retail galleria. The purpose of the analysis of local wind conditions and the wind tunnel studies conducted by Battle McCarthy was to determine the expected quality of the wind environment, and assess whether the level of comfort would be sufficient at the worst time of the year. Tests were conducted by simulating local prevailing wind directions, wind speeds and temperature levels.

Several options for the galleria roof design were tested in the wind tunnel, and further design alternatives were subsequently refined on the drawing board to explore the findings of the tests. These were mainly concerned with reducing the funnelling effect of the canopy structure all year

round and improving winter conditions for pedestrians. The various designs included permanent and temporary windbreakers and shields, entrance marquees and concave arc walls. Eventually, a map was produced identifying critical windy areas as well as areas that were suitable for various activities and pedestrian movements, such as shopping, strolling and sitting.

The idea behind the galleria retail 'street' was that it should be more than just a covered walkway extending to shops and other attractions. It had to be different from an American 'mall' typology, as well as providing a stimulating, exciting and comfortable environment for a host of activities throughout the year and allowing users to experience seasonal changes. In order to retain 24-hour access across the site as part of the pedestrian zone, it could not be an enclosed, artificially lit or air-conditioned space.

The canopy roof is not completely sealed; it has local openings and vents that allow an exchange between the air volumes around the canopy. This allows the removal of heat gains from underneath the roof. Shade in summer is provided by some temporary external/internal shading devices and the adjacent building profiles.

Section and plan illustrating the sequence of events across the blocks, the building and the public spaces



In winter the galleria is effectively a moderated outdoor space where occupants and users are expected to wear outdoor clothing. It will, however, temper the effects of the outdoor environment by minimising heat loss, exploiting passive solar heating and natural ventilation, using heat exhaust from adjacent shops, and capturing radiant heat from shop façades.

exchanger coils. This measure would reduce the need for conventional cooling towers.

The authority charges for both river water usage and used (heated) water disposal. Maximum water volumes, as well as maximum used water temperature, must be agreed in order to provide enough financial data for a proper assessment. A detailed and informed financial

assessment must be carried out before a decision can be made on the use of the system.

on two levels, and merges seamlessly with the square to provide smooth, continuous access to the river. The integration of the different levels adjacent to the river creates a sense of arrival for boats and visitors coming from far away.

The landscape strategy uses the difference between the river level and its flood level (development level) to create a linear park composed of folding planes with incidental spaces for social interaction and public amenities.

The park plan takes its cue from similar recent urban riverfront projects along Europe's more unpredictable rivers, such as the redevelopment in Düsseldorf, Germany along the Rhine. Permanent cafés and restaurants are situated at the higher level along the building edge, with temporary cafés and activities at a lower level.

Making a positive impact

At its best, a master plan developed in the context of a very different political climate can set standards of conduct and behaviour across the

There is no new look for this type of project or its component buildings – it represents a completely new mindset

A coherent water strategy

Several options are being explored to use free energy of ambient water. The first of these initiatives plans to use river water from the Danube as a heat sink. Pending the Danube River Authority's approval, water-borne excess heat would be siphoned away from the buildings via titanium steel

assessment must be carried out before a decision can be made on the use of the system.

The Danube River Authority has provided 1000-year flood levels for the ground floor, to which they would add an additional safety factor to ensure security for the site.

The riverfront park offers activities

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private and public sectors. If successful, it opens up the possibility of adapting over time to new needs and uses.

Having inherited a master plan, it is obvious to us that a political vision can strongly dictate the way in which public space can be experienced. Democracy and the free exchange of goods and ideas are values that ought to be shared by the many, not limited to the few.

Beyond the master plan, the Pribinova development is seen as a groundbreaking development, an opportunity to implement many of the ideas that have been evolving in practice for the last decade. The combination of the Slovakian market opening up to western investment, an enlightened client and supportive local government has created the conditions for an exceptionally cohesive and forward-thinking project, in which new ground is being broken by all parties.

The scheme and detailed design stages of the project will offer the team the opportunity to further their sustainable credentials and demonstrate that sustainability is not a fashionable piece of jargon but a genuine design process. There is no new look for this type of project or its component buildings – it represents a completely new mindset.

Most significant work produced today is not unified by style. Successful design emerges from collaborative teams of architects, planners and engineers, and the finished projects differ greatly in appearance.

If some of the best are linked by a common theme, the link tends to be conceptual rather than visual. It is the idea that we live perpetually on the threshold between our inner and outer world. This link is psychological rather than visual, but it also has cultural implications; it shows how architecture offers a synthesis for urban life.

Today, 50 per cent of the world's resources are consumed by construction. The opportunity to make a positive contribution, in terms of encouraging a responsible attitude to the consumption of these resources and to the subsequent generation and disposal of waste, is one that should be embraced by all parties involved in the building process.

Designers should see sustainability as an opportunity rather than a constraint, developers should not be afraid of the balance sheet (if marketed positively, sustainability could actually contribute to profitability) and governments should not shirk their responsibility to legislate for the greater good in the short term. We all need to look forward to the long term and change the course of the future. ■

Michel Mossessian is an associate director in SOM's London office. He was educated at l'Ecole Nationale Supérieure des Beaux-Arts in Paris, France and at Harvard University in the USA. He has worked on a number of notable international projects during his nine years with SOM.

In the last two years he has led several competitions for SOM in Europe, including the master plan for Campolide Parque, a 140,000m² mixed-use development in Lisbon, Portugal, and the new 172,000m² NATO Headquarters in Brussels, Belgium. He has lectured in the USA and Asia, and has taught architectural design in the USA at Harvard Graduate School of Design, the University of Illinois and the University of Pennsylvania.