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ASPERN SEESTADT's FUTURE CHALLENGES

The Master Plan for the new town Aspern Seestadt has been approved, the new U-bahn line has already been constructed, and some people already gathered on the empty air-field where the construction is supposed to get started. The group of people is composed of persons responsible for the future actions, young artists using some of improvised facilities on the spot, and some eager professors and student with fresh and even challenging ideas for the Aspern Seestadt's future.

The first queries relate to the Plan. Is it sancrosanct, prepared to tiny details in 1:200 scale, with classic buildings and their layout around the lake, with pedestrian zones, greenery, playgrounds and social systems? Is it supposed to have some economy or will it be a simple satelite town in the vicinity of grand Vienna, the European hub? How about people that will come and stay there for some time to live and work? How about their aspirations, specific needs and wishes? Is it all registered and given to urban planners and architects to make their vision of the town and to make future inhabitants happy? Is it open to some fresh, non-standard ideas and the place where its future people will say their yes or no? Finally, how the sustainability of the town will be guaranteed, if we take into consideration some similar planning endeavours in Europe where enthusiasm was at the beginning and disappointment after some time?

Town making asks for principles

The old and well-known study "The Oregon Experiment" of Christopher Alexander[1] could be one of serious warnings to the future of the Aspern Seestadt's Master Plan. The traditional planning used to be a kind of blue-print-of-our-future making ('the cartoon of our utopia' as some American commented). The 'new town' ideas were result of such kind of planning: people living in a new town happened to be the product of the planning idea, instead of the town being the product of people settling in it. Such a master plan can produce totality instead of natural whole, totalitarian instead of organic (natural) system. According to Alexander, the process of planning and constructing new town can satisfy human needs only if follows the next principles:

1. **Organic schedule** – the planning and construction guiding the whole to appear out of local procedures. The plan is necessary, but the plan able to be adapted to natural, social or economic changes. The whole would be emerging out of local procedures, step-by-step. The future community (group of people ready to settle in the new town through their representatives in coordination with developers) would approve the process and basic principles instead of map with the detailed drawings how the town will look like in the far future.
2. **Participation –** all decisions on **what** and **how** to build would be in hands of users. The organic (natural) growth and development of a town can be directed only by its

[1] ALEXANDER Christoph, (1975), The Oregon Experiment, Oxford University Press, New York

population, their needs, aspirations and attitudes. The detailed plan can't imagine all possible diversities delivered by inhabitants. Participation means any process where users help planners and developers how to form their place of living. All ideas, no matter how feasible they are, should be taken into account.

3. **Step-by-step growth –** the growth going by small steps, where any project will be adapted to functional or locational changes. Changes in human behaviors, economic capacities, social needs or value system are key facts to direct or redirect the growth or development of a new town. Of course, capital infrastructures (major traffic lines, pipelines, hydro- or energy-objects, waste disposal, etc), together with public spaces (lake, banks, parks, squares, etc.) ask for more precised and detailed plans from the beginning as a kind of guidelines (skeleton?) for the future town layout.
4. **Patterns –** the planning and construction would be directed according to a collection of adopted planning principles. The board of users should adopt any pattern. A pattern illuminates any problem expected to be repeated, the context of its appearance and general approach to its solving. The pattern is supposed to be basic prerequisite for making living environment friendly to both community and individuals. The set of patterns depends on the place or the concrete town, and could be: street or path networks, public greenery, sport activities, parking space, pedestrian zones, mode of building orientation, height of buildings, economic activities, social services, etc, etc. The set of patterns is open to permanent modifications, or addings, and approved with argumentation on public meetings.
5. **Diagnosis –** the prosperity of the community will be protected by annual diagnosis or report indicating major problems, mis-steps or mis-forms, and suggesting the next steps for improvement. The urban system should be permanently controlled and repaired based on the report open to public hearings, adopted and published by the board of users, thus following the natural way of growing. The urban economy and its partial autonomy is indispensable to support this way of growth and development.
6. **Harmonization -** the organic town development will be provided by financing the process where individual users can participate with their ideas, responsibilities and funds. The totally centralized system of financing goes towards totalitarity. The individual users should be free of plan limitations, propose their ideas to the board of users and discuss it with them before approval. The ideas should be harmonized to adopted patterns and actual diagnosis, and not confronted to the general system of financing.

These six principles, according to Christopher Alexander, brings us to **open planning** system, making more feasible results just in new town planning and construction. How Aspern Seestadt relates to them?

Urban future is the Nature

An urban settlement (town or city) is the largest human endeavour and the largest human product, with serious consequences to the Nature. At the beginning the consequences contributed to cultivating the Nature. In the sequel, the growth of urban settlements progressively jeopardizes the natural elements (soil, water, air), nowadays threatening with catastrophe in many cases. That is why planners, developers and decision makers have to

think primarily of the Nature and its capacities when thinking of a new town. What are opportunities, challenges, possible confrontations and possible coexistence between urban structures, human activities and the Nature?

When we think of the Nature we understand it through its four main elements: soil, water, sun (sun, climate), air. But the fifth element, people, are also part of the natural system, using, and also abusing or misusing other elements of the Nature. Confronted to the Nature in many cases with their activities, people are generally forgetting that in fact they confront themselves. The Nature, as a complex and dynamic system, is stronger and more adaptable than people, so the final victim will be not the Nature but the people. Of course, that is long term perspective but should not be forgotten today.

How the Aspern Seestadt Master plan relates to that? Is it a basic concern of developers, planners, decision-makers or will be left to the first generation of the new town inhabitants? Is the Nature, with its elements, the matter of economic calculations, with its costs and benefits to present and to future generations?

Instead of elaborating all elements of the Nature (see the paper of Prof. Werner Kvarda on Permaculture issues), with their position in the Master Plan, here will be listed some key questions and short statements related to this sensitive dilemma.

- ***The soil use*** is the paramount issue, due to the large amount of soil that will be sealed under constructions. The quality of soil is expected to be examined with its productive capacity and possible loss with the town developing. The matter of land ownership is highly significant due to different interpretations of it: is the ownership right absolute or relative? Is land use, if private, controlled by public institutions and to which extent? Does land use map in the Master Plan takes care of possible food productive activities (green-landscape edible)? Does administration think of compensating lost soil capacities under the future town with improving capacities in its surroundings? What will be real losses in terms of natural biodiversity and breaking some of ecological processes in the sealed soil? What could be idea of multifunctional and sustainable soil use economy in the new town[2]?
- ***The water use*** is intrinsic issue in Aspern Seestadt for several reasons. First is potable and industrial waters supply. Second is liquid waste treatment? Third is the lake and its destiny with existing water sources and future town activities? Fourth is the question of integrative water management? The City of Vienna is highly sophisticated in water issues, and relation to Aspern Seestadt is interesting to get analyzed.
- ***The air*** will not be threatened by pollution as can be seen from Master Plan. But the matter of climate change impacts by energy and type of energy resources is the crucial one. A challenge is optimal scenario to save air of CO2 emissions with a long-term scenario (up till 2030). The consumption of energy will grow as the new town get developed. Therefore the energetic efficiency in construction will be the growing issue as well. What will be dominating energetic resources and what will be the role of renewables (what about wind, sun, etc)? Electric and heating production and supply,

[2] BLUM Winfried, KVARDA Werner, (2007), Challenges for Soil Science in View of the European Thematic Strategy for Soil Protection, Academia Danubiana 4/2007, www.academia –danubiana,net

transport needs and provisions, building energetic efficiency, as well as management of energy distribution will be main questions in this sector, asking for prudent answers.

Urban sustainability is tangible

The issue of urban development, and the issue of the new town making in particular, is deeply connected with ecological challenges. Greenhouse gas emissions are dominantly generated by urban areas approaching to 80% of total. The proportion of renewable energy consumed in European developed cities is 7,3% only, far from expected EU standard of 20% in 2020. The soil sealing and the soil loss and damages are generally products of urban development. The problems of potable waters, solid waste disposal or liquid waste purification are getting more and more expressed as urban areas are spreading over the land. The problem of leakages in potable water systems is coming up to 30% and less than 1/5 of solid waste is recycled. These and similar problems are becoming crucial elements of urban and, consequently, human sustainability. The ***soil use pentagon***[3] is one of warning examples of destroying consequences on urban development, conceived on irrational links between private ownership, administration and human activities. The intensive climate change and its interdependence with energy consumption is another example of urban development negative consequences. Thus the environmental performances of an urban area are becoming predominant issue when making a new urban structure is the matter of discussing. Making plan for a new town (Aspern Seestadt?) has to be confronted with the basic queries: (1) Is the new town sustainability matter of ex-ante measuring during the plan preparation, or ex-post when the plan will be realized; (2) What type of plan is feasible and reliable to measuring the town sustainability; and finally, (3) Is urban sustainability measurable at all? These queries are becoming some of key challenges to urban governance due to their ecological, economic, social and even political consequences.

The good governance (mode of governing) of a town/city depends on efficiency and reliability of its government, and the reliability depends on information and clarity of categories and indicators for measuring quality of urban environment. Some initiatives such as Urban Ecosystem Survey[4] or European Green Capital Award present first attempt of measuring urban areas environmental quality. The new attempt with Green City Index is promising the more complex evaluation of urban sustainability. Its reliability lies in 8 categories and a set of individual indicators (30) measuring main elements of urban environmental system and positioning an urban area, among other comparable urban areas, by using transparent and reliable scoring process. Practically, the Green City Index could serve as an instrument to measure present situation of a city through 8 indicators and also to measure plan and its vision for the future. Of course, the size of urban area slightly matters. As bigger is the city as bigger are the environmental problems (?). But on the other hand the scale economy says: the bigger city has more capacities (financial, institutional, etc) to handle the problems.

[3] STOJKOV B. (2010) Soil Use Pentagon, at www.academia-danubiana.net
[4] Urban Ecosystem Europe, (2007), Ambientalia, www.ambientalia.it

The categories for the Green City Index are as follows[5]:

CO2 emissions per inhabitant – EU27 average is 8.46 tones and the best example among EU capitals is Oslo with 2.20 tones. The result of Oslo is depending on its geographical position, mountainous area in the background, clean hydroelectric power and, as the most important, local governmental initiatives and actions to cope with the problem (car emissions control, industry pollution reductions, use of renewable energy, energy efficient building constructions, joint heating system, developed public transport and use of electric cars, conversion of oil heaters to bio-fuels, etc).

Energy – The sustainable urban development directly depends on energy, its resources, its quantity and quality, and its reliability. The problem for a town is that energy policies depend on both state and local policies, often not harmonized. The advantage of a new town is its possibility to precisely define its energy policies, coordinated with the state ones, at the beginning of planning process. The use of renewable and non renewable resources, selection of technologies for electric power, gas, oil and heating systems, regional connections of energy systems, together with adequate price policies and measures to reduce energy consumption, are important issues of urban policy makers in cooperation with all stakeholders.

Buildings – The buildings from different historic periods produce different impacts to the environment**.** The energetic efficiency in constructing, industry, traffic and public services are of utmost importance for city sustainability. Types of buildings and the level of sustainability are in proximate relation, due to the mode of using energy and the type of energy resources. This problem is easier to control in new towns if controlled from the beginning of the planning process. The cost-effective measures for saving heat energy can be measured by insulation of outer walls and roofs, type of windows and the building heating system. The carbon emissions per apartment and energy consumption are measured by tones and kwh, and should be controlled in the process of building designing. The building standard in Stockholm is 2000 kwh per house and in Great Britain is 3600 kwh.

Transport – The urban transport is under city/town government jurisdiction and can be controlled by planning measures and direct urban policies. The relation between private and public transport is one of the key issues. The next is the mode of circulating (car, cycle, pedestrian) and, finally, the energy resources for vehicle moving (gas, oil, electric power) and incentives given to selected one. Technology is important instrument, but planning measures in traffic network layout are paramount in terms of anticipating possible congestions, places of living and working relations, and commuting to urban functional surroundings and back. In terms of technology the City of Stockholm is trying with eco-adapted transport system (ethanol buses) but it is expensive. Anyway, renewable energy resources are dominant orientation together with cycling and walking, very convenient in smaller towns.

Waste – the waste management encompasses solid waste disposal and treatment, liquid waste guiding and purifying, but also land use control with special attention to the soil. The solid waste recycling is one of current issues, with all the measures to select it and treat it with

[5] European Green City Index, (2009), Siemens, Munich, www.siemens.com/greencityindex

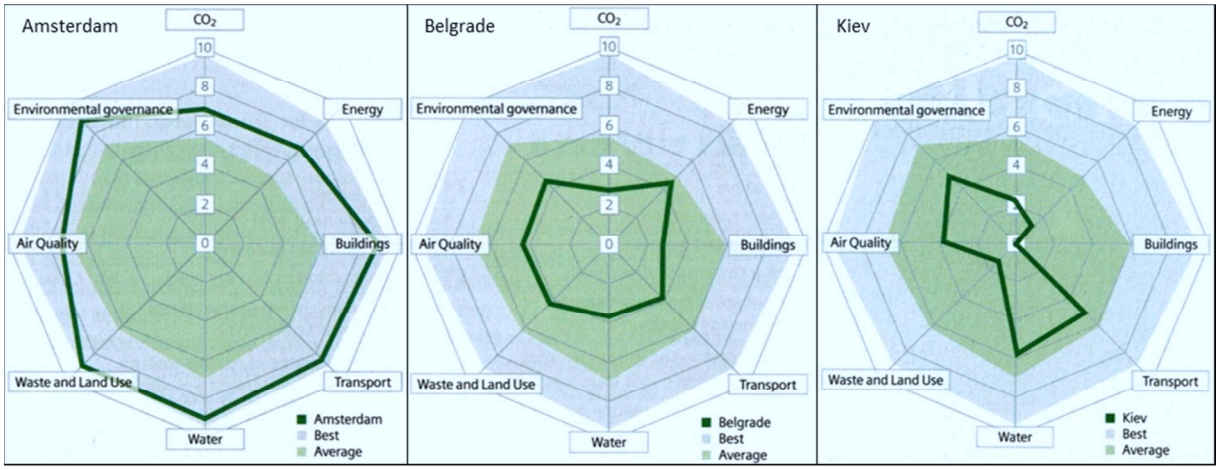
appropriate technologies. Collecting waste from individual houses asks for proper contacts of individual waste producers and waste users. Zurich produces only 406 kg of waste per inhabitant and average in EU27 cities is 511 kg/inh. Collecting and incinerating systems in Vienna and Amsterdam contribute to the heating system for large urban areas. The scale of recycling is 34% of waste. Liquid waste guiding and purification is costly system and asks for a highly rational approach. The use of soil is matter of planning process but also asks for prudent urban policies in town development, measuring also long-term costs and benefits for the community and not only short-term interests of developers and policy makers. The land ownership is of utmost importance: is private land ownership absolute or relative right of owners and what is public interest in it?

Water – the water supply and management is becoming high-ranking issue in town making and developing. The excessive use of clean water, leaking in water systems, contamination threats. Amsterdam is registered with the lowest water consumption, as low as 53.5 liters per person, and water lost as low as 3.5 %, compared to 23.5 % in average. The designed water supply system and its connection to the main distributor, use of proper materials, geographic features (morphology, underground waters, climate), and strict maintenance are basic components for such a result. The price of water use and the way of metering the use of water per house or per apartment are crucial elements of urban water policy. The main water policy would be based on the principle “making water system climate neutral”. For this, use of renewable sources of energy are important with generating energy from the sludge after sewage treatment. This means the strong connection of water and sewage systems, that is “integrated water management”.

Air quality – That is one of indicators generally applicable to existing urban structures. Nevertheless it is important element of environmental structure that could be measured ex-ante, that is during the planning process and master plan evaluation. The air quality depends on land use organization, position of working (especially industrial) activities, transport system, energy system, greenery and open spaces, layout of housing, etc. Anticipating air quality in the future new town asks for detailed analysis of all structures of urban system that have direct and indirect impact to it, together with future urban policies indispensable to monitor, evaluate and protect or enhance air quality.

Environmental governance – The listed indicators ask for prudent, reliable, efficient, transparent, coherent and horizontally/vertically coordinated governance. The master plan of a town should have an idea on town organization and governing as explained under measures and instruments for plan implementation. Plan without it will leave the town destiny to the future government without proper idea on adequate, locally adapted mode of governing.

Figure 1 Green City Index of Amsterdam, Belgrade and Kiev



Source: European Green City Index, Munich, 2009

These 8 categories are generally measurable, based on available data in the Master plan or local statistics. If some data are missing approximate from national statistics could be used. "The quantitative indicators should be normalized on a scale of 0 to 10, where 10 points were assigned to cities that met or exceeded certain criteria on environmental performances. Cities will be scored either against an upper benchmark or lower benchmark. Benchmark targets were chosen from international or European directives. For example, an upper benchmark of 50% is set for the amount of waste that cities should aim to recycle, which is in line with the EU 2020 target for recycling waste. Cities that met or exceeded this benchmark will score 10 points and the rest will score between 0 and 10 points based on their distance away from the target. Where no targets exist the city will be scored by the standard deviation from the mean, with the best city scoring 10 points and the worst scoring 0 points"[6]. The Green City Index is composed of aggregate scores of all indicators, first by category and finally overall, that is composite of category scores. A bit complicated calculation but usable for measuring and evaluating the future performances and sustainability of Aspern Seestadt as its Master Plan indicates for its future. The following table shows categories, indicators and weightings for 30 European capital cities.

[6] European Green City Index, pp 38

Table 1 List of categories, indicators and their weightings

List of categories, indicators and their weightings

Category	Indicator	Type	Weighting	Description	Normalisation technique
CO_2	**CO_2 emissions**	Quantitative	33%	Total CO_2 emissions, in tonnes per head.	Min-max.
	CO_2 intensity	Quantitative	33%	Total CO_2 emissions, in grams per unit of real GDP (2000 base year).	Min-max; lower benchmark of 1,000 grams inserted to prevent outliers.
	CO_2 reduction strategy	Qualitative	33%	An assessment of the ambitiousness of CO_2 emissions reduction strategy.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
Energy	**Energy consumption**	Quantitative	25%	Total final energy consumption, in gigajoules per head.	Min-max.
	Energy intensity	Quantitative	25%	Total final energy consumption, in megajoules per unit of real GDP (in euros, base year 2000).	Min-max; lower benchmark of 8MJ/€GDP inserted to prevent outliers.
	Renewable energy consumption	Quantitative	25%	The percentage of total energy derived from renewable sources, as a share of the city's total energy consumption, in terajoules.	Scored against an upper benchmark of 20% (EU target).
	Clean and efficient energy policies	Qualitative	25%	An assessment of the extensiveness of policies promoting the use of clean and efficient energy.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
Buildings	**Energy consumption of residential buildings**	Quantitative	33%	Total final energy consumption in the residential sector, per square metre of residential floor space.	Min-max.
	Energy-efficient buildings standards	Qualitative	33%	An assessment the extensiveness of cities' energy efficiency standards for buildings.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
	Energy-efficient buildings initiatives	Qualitative	33%	An assessment of the extensiveness of efforts to promote energy efficiency of buildings.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
Trans-port	**Use of non-car transport**	Quantitative	29%	The total percentage of the working population travelling to work on public transport, by bicycle and by foot.	Converted to a scale of 0 to 10.
	Size of non-car transport network	Quantitative	14%	Length of cycling lanes and the public transport network, in km per square metre of city area.	Min-max. Upper benchmarks of 4 km/km^2 and 5 km/km^2 inserted to prevent outliers.
	Green transport promotion	Qualitative	29%	An assessment of the extensiveness of efforts to increase the use of cleaner transport.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
	Congestion reduction policies	Qualitative	29%	An assessment of efforts to reduce vehicle traffic within the city.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
Water	**Water consumption**	Quantitative	25%	Total annual water consumption, in cubic metres per head.	Min-max.
	Water system leakages	Quantitative	25%	Percentage of water lost in the water distribution system.	Scored against an upper target of 5%.
	Wastewater treatment	Quantitative	25%	Percentage of dwellings connected to the sewage system.	Scored against an upper benchmark of 100% and a lower benchmark of 80%.
	Water efficiency and treatment policies	Qualitative	25%	An assessment of the comprehensiveness of measures to improve the efficiency of water usage and the treatment of wastewater.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
Waste and land use	**Municipal waste production**	Quantitative	25%	Total annual municipal waste collected, in kg per head.	Scored against an upper benchmark of 300 kg (EU target). A lower benchmark of 1,000 kg inserted to prevent outliers.
	Waste recycling	Quantitative	25%	Percentage of municipal waste recycled.	Scored against an upper benchmark of 50% (EU target).
	Waste reduction and policies	Qualitative	25%	An assessment of the extensiveness of measures to reduce the overall production of waste, and to recycle and reuse waste.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
	Green land use policies	Qualitative	25%	An assessment of the comprehensiveness of policies to contain the urban sprawl and promote the availability of green spaces.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
Air quality	**Nitrogen dioxide**	Quantitative	20%	Annual daily mean of NO_2 emissions.	Scored against a lower benchmark of 40 ug/m^3 (EU target).
	Ozone	Quantitative	20%	Annual daily mean of O_3 emissions.	Scored against a lower benchmark of 120 ug/m^3 (EU target)
	Particulate matter	Quantitative	20%	Annual daily mean of PM^{10} emissions.	Scored against a lower benchmark of 50 ug/m^3 (EU target).
	Sulphur dioxide	Quantitative	20%	Annual daily mean of SO_2 emissions.	Scored against a lower benchmark of 40 ug/m^3 (EU target).
	Clean air policies	Qualitative	20%	An assessment of the extensiveness of policies to improve air quality.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
Environ-mental gover-nance	**Green action plan**	Qualitative	33%	An assessment of the ambitiousness and comprehensiveness of strategies to improve and monitor environmental performance.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
	Green management	Qualitative	33%	An assessment of the management of environmental issues and commitment to achieving international environmental standards.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.
	Public participation in green policy	Qualitative	33%	An assessment of the extent to which citizens may participate in environmental decision-making.	Scored by Economist Intelligence Unit analysts on a scale of 0 to 10.

Source: European Green City Index, Munich, 2009

Urban small is big

Finally, let us remember another name from the urban planning history, the name of Jane Jacobs with her revolutionary ideas in American, and consequently European, urban planning. In her book on American cities and their tremendous decay after post-war urban planning failures[7], she defined the main reasons of that. The immense endeavours of city planners and decision makers to develop and modernize big American cities after the II WW, with enormous financial powers, she put her attention to results. Her idea was that cities are an immense laboratory of trials and errors, failures and successes in city design and building practices. Instead to admire to the grandness of American cities with gigantic highways crossing and cutting them, she payed attention to forgotten small elements of a city. Instead of fascinating motorways she concluded that streets and their sidewalks and the main public spaces are vital organs of a city[8]. *If streets look dull the city would look dull*, says J. Jacobs. Her statement is generally based on public space (streets, sidewalks, lake quays, squares, parks, playgrounds, etc) and not buildings alone. Deserted streets are unsafe, therefore mixed used streets are recommended. *As greater the range of legitimate interests that city streets and their enterprises can satisfy, as better for the streets and their safety*[9].

The idea is that small in a town can be big (great?) if properly planned and developed, if streets are interesting and continuously alive, and if carefully knitted in a town network (not only the main street!!). *A pool of economic use only where their long, separated parts meet and come together in one stream*[10]. Other public spaces should be organically connected to the street network thus producing functional identity of different town zones (zonal identity). Land use mixture is indispensable to make ''color'' of a zone and to add to continuity of day/night continuity. Blocks have to be smaller making comfortable life to its residents and better relation to neighbors. Overcrowding can hamper social environment in a block, and possibilities of accessing different conveniences and other diversity should not be the privilege of people in the town center only. Too high or too low density in a block are when they frustrate town diversity instead of abetting it. *The task is to promote city life of city people, housed in concentration both dense enough and diverse enough to offer them a decent chance at developing city life*[11].

The idea of fostering lively and interesting streets and making the fabric of these streets as continuous a network as possible throughout a district (zone), together with other public spaces connected, open ways to making great and not a big city. It asks for unaverage clues involving comparably very small quantities. New town such as Aspern Seestadt, in close vicinity to large Vienna, must rely on its access to this European cultural center, thus spreading its cultural opportunities. But, making its own identity, Aspern Seestadt should pay attention to the new architecture of its buildings and their regional identity, with some recognizable landmarks among them. Other factors of Aspern Seestadt identity would be its

[7] Jane Jacobs, The Death and Life of Great American Cities, A Vintage Books, New York, 1961
[8] J. Jacobs, ibid, pp 29
[9] J. Jacobs, ibid, pp 41
[10] J. Jacobs, ibid, pp 179
[11] J. Jacobs, ibid, pp 221

natural elements (lake, greenery), specific cultural image and economic activities (???) recognized in its wider surroundings.

Someone could be thinking on it working on the Aspern Seestadt’s sustainable future.