

This is my Residency Report:

When I began the AIR Krems residency, I expected to examine city and town zoning regulations and policy with respect to energy self-sufficiency. When I arrived in Vienna and saw the buildings in the ringstrasse however, I suddenly recalled the writings of a very important nineteenth century Austrian urban designer, Camillo Sitte, whom I had last studied in 1975. What I saw, and what I didn't see, in Viennese urban design, caused me to immediately begin to re-read Sitte and examine his work and the places he had lived and experienced.

Sitte's book, "Der Stadtbau nach seinen kunstlerischen Grunsatzen," or in English translation "City Planning according to Artistic Principles," was extremely influential in international city planning circles, from immediately following its publication in 1889, through the growth of the 20th century metropolis in the 1920's, fading but not completely ceasing to be important during the high modern period of the 1950's and 60's, and today it continues to engage "New Urbanist" village and suburb designers. The book is no longer respected in today's urban design circles, but this deserves more study.

In my statement of research, I initially limited the scope of my work on urban planning to purely formal large scale shaping issues, driven by questions of wind and shadow. During my residency, it became clear that questions of response to human scale, slow pedestrian circulation, and perception and orientation in the city, should and could also be folded into my work. This is the result of my re-reading of Sitte's work, and the result of the research I did on the seven years in Sitte's life and work that lead up to the publication of his book.

While a student Sitte had worked under two influential figures - the architect von Ferstel, and the art historian Eitelberger. through their influence Sitte was appointed to direct school of design and architecture in Salzburg in 1875. During his eight years in Salzburg, Sitte was a Renaissance man, publishing works on subjects ranging widely from the decorative arts to the perspectival technique of Piero della Francesca. The impact of this period on his work is not emphasized in Sitte's biographies, and so during this residency I went to Salzburg to examine its urban fabric and see how that relates to the canon of rules in his book. There I examined first hand examples of Austrian urban design that encapsulate perfectly the ideas Sitte was later to describe coming from a more pan-European milieu.

In 1883 Sitte was invited back to Vienna to lead a newly organized school of Applied Arts. Today Zaha Hadid is a Professor teaching architecture and urban design at its descendant school. But during the 1880's, because of the building of the Ringstrasse, and the continuing influence of Sitte's teacher Eitelberger, Sitte began writing about urban design. He was not given the opportunity to build at the urban scale in Vienna, but I believe the ideas he saw in situ in Salzburg became the inspiration and grist for the ideas in his book.

As recently as 1945 no less a protean modernist than Eliel Saarinen wrote that Sitte's ideas were not dependent on their historical fabric, but could easily and effectively be used given any style of building. The Yale dormitories designed in 1961 by his son, the great and undisputed modernist Eero Saarinen, are clearly done with an understanding of the ideas in Sitte's book. But today, because of similar ideas championed by the "New Urbanists," and because of the way those ideas are held as an anathema by today's most avant garde architects, the book remains in a limbo from which I believe it should be saved.

As an interesting aside, Alvin Boyarsky wrote his Masters Thesis on Camillo Sitte at Columbia University in 1965. Soon after that, Boyarsky was acclaimed as the brilliant new leader of the Architectural Association, at that time and for decades afterward, Europe's most influential, decidedly modern and avant garde architecture school. Boyarsky taught and hired the teachers that taught Zaha Hadid while she was there, and later hired her to teach at the AA. I suspect that some of the ideas of Sitte that Boyarsky studied so carefully may well have come up in critiques.

Though generally ignored, or even formally disavowed today, I believe these ideas can be seen in Hadid's work. this will make for an interesting and pleasingly disturbing article.

I plan to apply Sitte's ideas to the smaller scale elements of my larger scale urban planning ideas over the next few months. They are essentially three dimensional, "Bebauungsplan," based on "Stadtbilder," and they will add important qualities I might otherwise have ignored, given my more "Wissenschaft" approach.

I thank the Krems Artist In Residence program for this marvelous opportunity, and I will repeat those thanks in the acknowledgements in my writings on this subject.

This is a more comprehensive statement about my current research as it stood before I came to Krems. With this in mind it is easier to understand how my ideas were changed and extended as a result of the residency and the study and travel it afforded me:

Creating downtowns that produce their own energy using new zoning envelopes.  
Anders Nereim

I'm working on a sabbatical project that I expect to produce a book. I've had the abstract accepted for conferences in Europe held by Consortia of City Planners, Architects, and Developers, so I know the interest is there, and this allows me to focus the research in that direction.

I'm working on a new phase in urban design, moving beyond Jane Jacobs' late 20th century discussion of livability and plan forms that separate or carefully mix the functional zones of a city. Instead, for the 21st century, I see the local production of energy by tall urban downtowns as crucial for the economic success of dense urban areas.

#### Background:

In the United States, the transcontinental electrical grid is extremely inefficient and unreliable, and the capital cost to replace it is seen a prohibitive by the industry and the government. In addition, the movement of resources of all sorts across state lines is proving to be more legally contentious every year. From the use of the Colorado River's water for irrigation and drinking, to the control of water transport and invasive species in the Great Lakes, to the shipping of garbage and radioactive waste and their final burial, each state has a stake that differs from the next state, leading to a lack of cooperation.

In this situation, while one county in Arizona could produce enough photovoltaic power to feed the rest of the United States, and a portion of North Dakota could produce enough wind generated electrical power to do the same, the decrepit electrical grid and substantial differences in economic interests keep these long distance solutions to our energy needs from coming to fruition.

#### Resolution:

It is possible to devise new zoning envelopes for high density downtown areas that will maximize the production of electricity by wind power and photovoltaics. All that gets in the way of this solution is the turbulence of wind, and the self-shadowing of buildings, in the urban canyons. These problems have characterized urban downtowns since the ground-breaking zoning ordinance invented by New York City in 1916, which has become a model for tall dense urban districts all over the globe.

By examining the fluid dynamics of eddies and whorls in stream beds, and translating

their genesis from the incompressible medium of water to the compressible medium of air, a more predictable laminar air flow can be encouraged in downtown districts, giving a vastly improved harvest of wind power. Similarly, by examining the problematic street and height configurations of 19th and 20th century downtown areas, and modifying the geometric aspects that produce the majority of the shadows cast on adjacent building surfaces, a much higher percentage of the collective skin of tall urban buildings can be successfully converted to photovoltaic power generation.

The net result will be more energy self sufficiency for newly designed downtowns. While it is very difficult to apply these principles retroactively to the downtowns we have right now, all across India and China there are new dense downtown business districts planned that can benefit from these new principles.

#### Techniques:

Today it is possible to model very large scale wind tunnels using the fluid dynamics and particle physics engines in high end commercial software, and thus gather the data necessary to optimize the creation of static eddies and whorls in the upper portions of tall downtown districts. With these digital models and their data, it is possible to scale up the investigation using super-computers and proprietary software to refine the resolution of the necessary zoning envelope. I am interested in doing that at the Argonne National Laboratories this fall when I am done with my basic research.

Similarly, a new kind of parametric design software allows the fine-tuning of shape and performance as they relate and control each other. This allows a new kind of pro-active formal modeling, to optimize and measure the cumulative shadow area in a newly defined downtown over the hours and the seasons.

#### Audience:

I see my primary audience for this research as the designers, developers, and municipal leaders in these developing countries. Urban design is also a commonly taught topic in schools of architecture as well as schools of urban planning, and those professors and their students would also be part of the audience. There are principles involved in the research that would lend themselves to this use in schools, and in urban planning offices. There is also a great deal of excitement among today's advanced students about the possibilities inherent in these two new kinds of software that I am using: particle systems and fluid physics, and parametric relationship modeling.

Anders Nereim, Architect and Professor

Department of Architecture, Interior Architecture, and Designed Objects  
Suite 1257 Sullivan Center  
School of the Art Institute of Chicago  
36 South Wabash Avenue  
Chicago, Illinois 60603

tel: 312-629-6650  
fax: 312-629-6651

[anereim@saic.edu](mailto:anereim@saic.edu)