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Solutions at a Glance:

DEVELOPING A SUSTAINABLE NEIGHBORHOOD IN SEATTLE

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"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete." - Buckminster Fuller

Jim Duncan of Sparling gazes out over a small retention pond tucked into one of the green spaces within the housing developments of Western Harbor. (photo by Denise Fong, Candela)

Lessons From Sweden

Over the past two years we have had the unique opportunity to bring Northwest developers, design professionals and public officials to Europe, where we have experienced first-hand innovative examples of urban sustainability. One of the first places we bring people to is the Västra Hamnen (Western Harbor) development in Malmö, Sweden. Western Harbor is a Disneyland of urban sustainability. With its greenroofs, car free streets, wetlands recharged by surface stormwater features, and an entire neighborhood powered 100% by renewable energy resources, Western Harbor challenges us to consider the possibilities in our own region.

Western Harbor was not always like this. When Ilmar Reepalu, the Mayor of Malmö, first took office in the 1990s, he inherited a city in free fall. Malmö, a historically blue collar town with some of the largest shipyards in the world, had seen its shipbuilding industry disappear within a few years. Mr. Reepalu, an architect, knew that bold measures were needed. It was clear that heavy industry was never coming back, so he created a new identity for the future of Malmö – global leadership in urban sustainability. Planning for Western Harbor, the "City of Tomorrow," was started in 1997. By 2001 the first phase of the site hosted Bo01, a major international building expo. Today, international delegations from around the world, including ours, come to see what is being created on this former brownfield site.

Western Harbor Today

Western Harbor's 395 acres of formerly contaminated shipyard land is being developed as mixed-use with affordable and expensive housing, a new university campus, and a combination of retail, office and service space. It will ultimately become home to 10,000 people and provide a work environment for 20,000.

Western Harbor is more than a collection of interesting projects – it is an entire district conceived and built on making it one of the most sustainable neighborhoods in the

world. The city drew up a quality program in collaboration with real estate developers to establish targets for green space, energy usage, parking, and other important considerations. For example, Green Space Factor guidelines outlined a menu of ways in which developers could achieve targets for maintaining green spaces and encouraging biodiversity. Greenroofs, porous paving surfaces, courtyards filled with natural vegetation – these and many other options gave developers great flexibility in earning the points needed to meet their requirements.

100% Sustainable Energy

One of the most inspiring goals of Western Harbor is that, on an net annual basis, 100% of the energy used in the district must come from renewable sources Western Harbor proves that it is possible to build a new urban district with no additional CO2 emissions from energy production.

The concept began with the premise that energy consumption must be minimized through energy efficient construction. All structures in Western Harbor are designed to operate within an annual energy budget of 105 kwh/m2, or about 33,280 btu/sf. By comparison, the Seattle Justice Center, a LEED Silver rated building regarded as one of the most sustainable in our region, is estimated to consume 77,800 btu/sf. The energy budget defines the target for their performance based energy standard, with most specifics on materials and building design left to the discretion of the builder. The emphasis is on "smart" buildings, and IT is used extensively to manage water and energy consumption.

The remaining energy needs are provided by a broad range of technologies – 400 sf of roof mounted solar PV panels and a nearby wind turbine produce electricity, kitchen waste is collected to produce biogas, and 4,600 sf of building integrated solar thermal panels fulfill 15% of the heating load. A ground source heat pump station coupled to a groundwater aquifer heat exchange system via 300 foot deep boreholes feeds into a district energy system to provide the remainder of heating and cooling needs.

Seattle based participants on an Urban Sustainability tour of Western Harbor looking at the vertically mounted solar collectors atop this restaurant and commercial building. (photo by Mark Brumbaugh, Brumbaugh & Associates)

These diverse energy resources, though largely installed on private property, are owned and operated by Sydkraft, the local energy utility. All energy systems have been tied into the city's electric and thermal distribution grids, allowing the utility to gain valuable experience in integrating these distributed resources.

Another interesting aspect is the way the city encouraged experimentation. In our meetings with architects, building owners and utility spokespeople in Malmö we learned that not everything worked out as planned. For example, detailed follow-up audits showed that some of the buildings failed to achieve their energy targets – the average district wide consumption is actually 125 kwh/m2 (39,600 btu/sf) which, while still exemplary by our standards, is 19% above the targets. Costs for some of the technologies, such as solar PV, were found to be uneconomical given current market conditions. Far from being viewed as failures, the knowledge gained from these discoveries is seen as one of the benefits of this living laboratory of urban sustainability. When investigators found that errors in the energy modeling software were largely to blame for the buildings falling short of the their performance expectations, the software was corrected to more accurately reflect reality. Ultimately, this improved software will be able to be more successfully marketed throughout the world.

What Does This Mean for Seattle?

In Sweden, implementing a grand vision is comparatively easy because of the top-down approach of the society. When Sweden wanted to create an urban showcase for sustainability technologies, it required

leadership and vision, but once the concepts were agreed to, making the vision a reality was easy compared to what it would take here. Sweden is a socialist country where the government still owns much of the land, and most residential and commercial development occurs through large tenant owned coops. In Seattle, such an endeavor would require significant collaboration between various government departments, a multitude of real estate owners and developers, residential and business tenants, and building professionals. This would be a daunting but exciting prospect for Seattle and, if actually implemented, would become our own showcase for the world.

Western Harbor is such a remarkable accomplishment because the city defined lofty but achievable goals, and then set out to determine how to achieve them. As Dick Robison of Mithun, a participant on one of the trips, remarked, "When they do something there they do it to a level that is extraordinary." The Visions of Urban Sustainability Poster (www.i-sustain.com/learningCenter/poster.htm), collaboratively developed by ISS and many of the other organizations that have explored these issues over the past two years, articulates five possible goals for a model sustainable neighborhood in Seattle:

- What if city centers were people friendly, so that families could live where they work?
- What if roofs increased urban green? (Look out from a downtown office and imagine what a difference it would make!)
- What if we dramatically decreased our reliance on fossil fuels by developing locally produced sustainable energy?
- What if stormwater was an amenity, and not just hidden underground?
- What if over 65% of commuters got to work by walking, biking or public transportation?

If we did all of this and more, would other communities in the United States and throughout the world, be interested in buying the products and the services that we developed through creating this reality for ourselves? Ask a simple question: after the breakdown of the transmission infrastructure on the east coast, and the continuing vulnerability of our energy supplies to disruption by terrorists, how many communities would like to have some part of their energy generated locally under their control? This is just one example of expertise we could gain here, and sell throughout the world.

Narrow streets help limit car traffic, and allow buildings to front onto the waterways that channel stormwater. The Turning Torso Building, designed by Santiago Calatrava, rises in the background as an iconic symbol of the new Malmö. (photo by Jim Mueller, Gregory Broderick Smith Real Estate)

Denmark is one place where they have already proven the economic benefits of sustainable development. Driven initially out of necessity by the high cost of imported energy supplies, Denmark embarked on a path to develop its own sustainable energy solutions and innovative approaches to building design. Today sustainable energy technologies are its largest export, and the industry employs thousands throughout the country.

Seattle is in a position unique within the United States. Local government, much of the development community, and the general public already have an orientation toward sustainability. A concerted effort by state and city governments and the financial and business communities to create and incorporate advanced sustainability technologies, products and services, would provide a proving ground for new products and needed experience for our professionals that could be leveraged to attract national and international clients. Developing a district utilizing the most advanced sustainability measures would create a visible showcase that would attract attention throughout the country and throughout the world.

The Northwest has shown over and over again how it can grow industries into positions of worldwide leadership, whether it's software, coffee, or airplanes. We have a rare opportunity to work together in a broad coalition of government and private interests to develop a new industry for the betterment of society, the environment and our economy. This is what sustainability is all about, and a city that's known for being green should be the leader.

The Urban Sustainability Study Groups to Sweden and Denmark

Jayson Antonoff and Patricia Chase are the owners of International Sustainable Solutions, which facilitates the sharing of knowledge and the creation of market opportunities for sustainability practices and products. In 2004, ISS brought several groups of architects, engineers, developers and others from the Pacific Northwest to Scandinavia to look at advanced urban sustainability projects. For information, see www.i-sustain.com.