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Sustainability metrics “address the various aspects of land development
and management that affect the ability of a site to provide a variety of ecosystem services.”

ASLA Sustainable Site Initiative, 2008



Putting Parking Lots to Work

This column has defined green parking in Green Parking, LASN Vol. ?, No. ? December 2010 as “parking lots that do environmental work. The column, Leadership in Green Parking, LASN Vol.?, No. ? January 2011 has also addressed landscape codes that allow sustainable practices in Chicago and New York City. It is clear that the nature of parking lots in urban areas is changing. If nature is to be preserved, protected or re-introduced to urban areas, the largest amount of available space to be found is within paved over land used for parking. In this column, Green Parking Principles we will examine the root principles of landscape sustainability and how they apply to the greening of parking lots.

One recent study of parking and green laws found that parking lots occupy about 10 percent of the land in U.S. cities, and can be as much as 20 to 30 percent of the land in downtown CBD areas. The study, by Dr. Kathleen Wolf, University of Washington, 2004 estimated that 80 to 90 percent of all U.S. parking demand is provided by surface parking lots. Due to zoning requirements that often over state the amount of parking required per land use, 2 or 3 times as much space is dedicated to parking as compared to floor space in the building being served by the parking. Lots for regional malls can be as large as 60 acres and mostly paved.

In all situations the ecology of a parking lot is non-existent. Paved parking increases the urban heat island effect, pushes polluted runoff quickly into fresh water streams or overloaded sewer systems and provide no habitat for wildlife and questionable habitat for people. Most parking lots as viewed from the public street are glaring and unattractive and their curb cuts are always potential traffic conflict points.

In fact, the environment of parking lots will vary from confusing to ugly to unsafe. The only function provided by parking lots is the temporary storage of cars. Often for just a few hours a day while people

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shop or work. And in many lots, vast swaths of paved parking go unused except during the holiday shopping period.

We call these urban land use areas “gray parking” since have no ecology. They provide no environmental services for mankind, they represent areas of the earth that have been totally destroyed from a nature point of view.

Designing parking lots to be green mean they must be designed using sustainable landscaping principles that will bring ecology and life back to these important parts of our cities and towns. But what are the principles that brings life back to parking lots and where do they come from?

Green parking lot design principles must be set forth by local zoning ordinances and landscape codes as we see in **Chicago, New York City, Seattle, Santa Monica and Irvine.**

We can also find the roots of green parking in the **U.S. GBC LEED Program** and the **ASLA SSI Program**. Both of these recently developed programs use rating sheets to tally sustainable metrics. Additional information can be found in the Landscape Architecture Foundation (LAF) **Landscape Performance Series** and through the **Seattle Office of Sustainability and Environment**. Various local sustainable landscaping programs found in **California, Florida, Louisiana** and around the **Chesapeake Bay** as expressed by the Chesapeake Conservation Landscaping Council (CCLC) also add ecological substance to any discussion of green parking lot design.

The common principles from these sources are summarized below.

Sustainable Landscaping Principles for Green Parking

Water: This recognizes storm water as a resource. Therefore water should be harvesting, conserved and reused. This principle requires more use of rainwater and less use of potable water for landscape irrigation. Storm water may be taken from parking lot surfaces and cleaned of non-point pollutants and pumped from parking lot detentions. Once filtered and cleaned, it may be recycled through irrigation systems or allowed to infiltrate back into the ground. Water from nearby rooftops or even domestic grey water can be harvested as well.

Air: This principle recognizes air as the most important resource on the planet. The goal of this strategy is to reduce air pollution and air born particulate matter. Since oxygen is generated by vegetation and carbon dioxide, a poison, is removed, plants are an integral part of generating cleaner air. Trees and shrubs can be used in and around parking lots to help purify the air.

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Soil: This recognizes productive soil as a resource and that wasted soil often enters fresh water bodies as a pollutant. Vegetation, mulching and proper earth grading will minimize top soil loss and polluted runoff. Productive top soil is essential for growing healthy vegetation. Sediment basins or parking lot detentions should be used to trap soil from runoff. Permeable soil must remain on the site for planting, nurturing and allowing infiltration of rain water.

Vegetation: Vegetation as one of the most important elements of nature in the city. In most of the principles set forth here, vegetation plays a role as an agent of environmental work so therefore is an important an essential resource for urban areas. Vegetation in its many forms such as forbes (herbaceous flowering plants), ferns, grasses graminoides, (grasses, sedges, rushes), ground covers, vines, shrubs, trees and flowering perennials plants are important environmental workers. Importantly, plant materials gather the energy of the sun and return nutrients and biomass to the soil. Plants are involved with many of the principles listed here. Of course every landscape architect understands this.

Wildlife: This recognizes wildlife as an important resource of the city. Certainly many wilder forms of wildlife will not co-habit the city with mankind, but some species do. They need shelter, food, water and land area to allow them to properly reproduce their species. Preserved habitat in various forms within the city serves this purpose for small animals, birds, insects, and reptiles. Parking lots should be designed as habitat for urban wildlife so they can continue to provide the ecological services wildlife is known to provide. A city without song birds is not as pleasant place to be.

Food Production: One principle of sustainable landscape development is the production of food. This may be food for wildlife or mankind. Green parking lots should utilize fruiting plants that will produce edible nuts, berries, drupes, legumes, pomes, tubers, rhizomes, bulbs, corms or stem shoots. Green parking lots can easily feature plants that provide a variety of edible plants. Be aware many plants have toxic parts so care should be taken in specifying which plant to use in public places. Toxic plant rule number one is always suspect a plant to be toxic, unless known otherwise.

Recycling: This recognizes recycling of used construction materials as an element of sustainable design. Recycling non-renewable resources can preserve scarce environmental assets while reducing construction costs. Eliminating waste to the landfill is an important idea of sustainable design. For instance, planted areas in and around green parking lots should be used as disposal sites for biomass, natural mulch and yard trimmings. Natural stone once used may be taken up and used again. Reusable precast pavers reduce the huge amount of carbon based energy used in the production of cement.

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Regional Design: Finally, the last but most important element of sustainable design directed toward green parking lots is a *regional based design strategy*. Regional design takes an earth systems approach to the design, construction and maintenance of landscapes. Earth systems of water, sunlight, soils, climate, vegetation, urban forests, natural habitat preservation and natural recycling ought to be incorporated into any landscape design. Since any project in any state is in fact built into a functioning ecosystem, it is important for that project to fit in with the wider regional system of climate, soils, sun, rainfall and vegetation. Earth friendly landscape design will utilize native plants and native landscape character. The site designer's first concern should be in preserving regional habitat and regional forms. The second concern should be rebuilding native habitat in regard to water, soil and vegetation. And finally, the third concern should be capturing regional character in the design of housing, industry, commerce and open space systems. Sense of place results when all regional factors are respected.

Regional character is derived from each state's various landscape features. In Louisiana these would be design concepts based upon the ecology of prairies, deltas, savannahs, beaches, ridges, *chénières*, terrace faces and forests. These ecologies can all be utilized as regional concepts for the design of green parking lots as well as site open spaces. Regional based landscape design will eliminate the use of invasive species which tend to push native plants out of their way. Regional based design will use plant material that supports the native wildlife population.

As can be seen, the above argument based upon sustainable design principles makes a strong case for changing the way we design parking lots. It is time to remove the sea of sterile asphalt and concrete that is the city center and replacing it with a green open space system that can do environmental work . Parking lots designed to be green can do important environmental work while storing cars and providing additional green space that people can use for various activities other than driving and parking cars.

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Fig. no. 1. Green Planting –K. Scarmuzza, Mathes Brierre Architects New Orleans