

# Growing a Healthier DC: Green Parking Lots



## In a healthier D.C., parking areas are green

Tree canopy shades most of the parking surface. Landscaped areas soften the visual impact and harsh environment of hot summer asphalt. Stormwater runoff is captured, cleaned and absorbed onsite using low impact development techniques like rain gardens, permeable pavers and vegetated swales. When not used for parking, these lots serve as community spaces for bike riding, roller blading, neighborhood fairs and farmers markets. Parking lots are an integral piece of the urban landscape, not just uninviting, empty spaces.

## Green parking lots

- Reduce temperatures by shading parked cars and pavement
- Provide attractive, onsite stormwater management
- Reduce the formation of smog and greenhouse gases
- Last longer because trees cool the pavement surface
- Create a friendlier, more walkable environment
- Serve other community uses when not needed for parking

The benefits of  
green lots will  
grow over time.

## Parking lots as green environments

**Cooler cars, cooler pavement.** Temperatures inside cars parked under shade trees can be 45°F cooler than those that are in full sun.<sup>1</sup> Shaded pavement can be 35°F cooler, which increases the life of asphalt and reduces maintenance costs.<sup>2</sup> Pavement cooled by shade trees reduces the urban heat island effect, making cities more livable and healthy.

**Less air pollution.** On warm days, gasoline vapors combine with air pollutants to produce ozone or smog, triggering health alerts about 20 days each year in the District. Far less gasoline evaporates from cars parked in the shade of trees. Lower temperatures from shaded parking lots mean less smog and relief for children, the elderly and asthmatics who suffer when ozone levels are high.

**Onsite stormwater management.** The parking lots in DC generate over 2 billion gallons of runoff each year.<sup>3</sup> This runoff contributes to flooding and sends pollutants like oil, sewage and trash into the District's rivers. Tree canopy over parking lots slows and captures rainfall. Bioretention areas planted with trees reduce runoff, trap pollutants and reduce sediments that flow into the District's waterways.





## Parking lots occupy 5% of the District's total land area.

### The Challenge and Opportunity

Washington, DC has more than 8,100 surface parking lots covering 2,100 acres or 5% of the land.<sup>4</sup> Most parking lots are unbearably hot in the summer and contribute little to the fabric of neighborhoods.

A number of cities in the US have a 50% shade cover requirement for new parking lots.<sup>5</sup> By contrast, DC regulations require only 5% landscaping with trees and shrubs. Changing District regulations to require more tree cover in parking lots and creating incentives to retrofit existing parking areas with trees and landscaping will help reduce temperatures, improve air quality and reduce stormwater runoff.

Many land uses within the District, such as schools and churches, have parking areas that are nearly empty except at peak times. Well-landscaped, green parking lots make ideal settings for farmers markets, recreation, community celebrations and other events. In the District, land is at a premium; when each piece of that land is designed to be useful, attractive and environmentally sound, everyone benefits.

### Recommendations

- Update parking lot landscape ordinances to require significant shading from trees.
- Minimize impervious surfaces and expand the use of materials like permeable pavers.
- Manage parking lot runoff onsite using techniques like bioretention areas.
- Create incentives to encourage retrofitting of existing parking lots to reduce stormwater runoff and increase shade.
- Plan for ongoing maintenance of parking lot trees, landscaping and low impact development.
- Encourage the design of parking lots to serve multiple uses.

Everyone appreciates a shady place to park.

*Green Parking Lots* is one in a series of issue briefs from Casey Trees. The *Growing a Healthier DC* series is a product of conversations with a panel of national and local experts convened in cooperation with District agencies, organizations and foundations. The panel examined how green infrastructure could be used to maximize social, economic and ecological benefits in the District of Columbia.

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- Green Parking Lots
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<sup>1</sup> *Actualizing Microclimate and Air Quality Benefits with Parking Lot Shade Ordinances* by E. Gregory McPherson, James R. Simpson, and Klaus I. Scott, *Wetter und Leben* 4(98), 2001.

<sup>2</sup> *Effects of Street Tree Shade on Asphalt Concrete Pavement Performance* by E. Gregory McPherson and Jules Muchnick, *Journal of Arboriculture* 31(6), Nov 2005.

<sup>3</sup> Calculated by LimnoTech as part of Green Build-out Model analysis, 2007.

<sup>4</sup> Calculated using data from DC GIS, DC Office of the Chief Technology Officer, 2005.

<sup>5</sup> *Where Are All the Cool Parking Lots?* Urban Forest Research, Center for Urban Forest Research, Pacific Southwest Research Station, USDA Forest Service, Jan 2002.