

Parking Lots and their impact on a community

Parking lots are a necessary reality, however, they come with some long standing quality of life and environmental issues. The following provides some facts about many of these issues.

Heat Islands:

- This effect has been detected in cities as small as 1,000 population
- The low moisture content of paving does not allow the sun's heat to be dissipated through evaporation. Tree Canopy cover addresses this by direct shading of the pavement and the transpiration of water through leaves.
- Un-shaded asphalt surfaces can reach as high as 160 degrees F. Shading paved surfaces can keep peak surface temperatures below 100 F
- Because of heat-absorbing surfaces, parking lots can elevate air temperature in sections of a city by as much as 20 to 40 degrees F.
- Data from the Madison Square Mall in Huntsville, AL found the surface temperatures above 120 degrees F. However, around a small tree island (two trees), the temp was only 89 F. Even a small area or tree shade surrounded by a very hot parking lot reduced temperatures by 31 F.
- Trees in Davis, CA parking lots reduced asphalt temperatures by as much as 36 degrees Fahrenheit, and car interior temperatures by over 47 degrees F
=> The functional life of asphalt is shortened as it thermally decomposes in repeated sessions of high heat, becoming friable and brittle. Shaded asphalt lasts much longer than un-shaded asphalt, reducing maintenance costs.
- Approximately 1degree F of temperature reduction is associated with each additional 10 % of tree canopy cover.

Air Pollution:

- Car interiors can reach 150 + degrees F without shade
- Trees cool air temperatures in parking lots and provide shade for vehicles, thereby reducing ozone-forming hydrocarbons that are emitted by cars.
- Trees help purify the air by absorbing exhaust gasses and giving off pure oxygen.

Storm-Water:

- A man made surface will generate 2 to 6 times more storm-water run-off (volume) than a natural surface.
- Trees reduce runoff and erosion from storms, thereby reducing the need for erosion control structures. In areas with trees, the use of smaller drainpipes and / or retention ponds saves money on materials, installation, construction and maintenance.
- Tree canopies catch precipitation before it reaches the ground, allowing some of it to gently drip and the rest to evaporate. This lessens the force of storms and reduces runoff and

erosion. Research indicates that a mature tree crown intercepts about 1,000 gallons of rainfall per year, reducing runoff and providing cleaner water.

Other:

- Un-shaded parking lots increase the energy costs associated with air conditioning of adjacent buildings.
- Trees provide shade for comfort when walking and after returning to the parked car.
- Help muffle noise, provide visual screens and contribute to surrounding property values.
- Breaking-up the massive expanse that usually dominates at parking sites provides a sense of scale that makes people feel more comfortable.
- Control speed and direct traffic flow.
- Attract and please customers and clients by providing a pleasant transition from roadway into the store or business area.
- Research shows that shoppers in well-landscaped business districts and shopping centers are willing to pay up to 12% more for goods and services.
- The net cooling effect of a young, healthy tree is equivalent to 10 room-size air conditioners operating 20 hours a day.

Design:

- We need to design surface parking that fits into the context of Oxford and further enhances it – as expressed in our Guiding Principles.
- If parking lots are made smaller to accommodate more trees, the reduced amount of impervious surfaces collects less water.
- For the same number of parking spaces, the total impervious area of a parking lot can be reduced by up to 33% by using 45 degree, double-parking bays and one-way driving isles vs. two-way driving isles and 90 degree, double-parking bays. (The latter is very common in lots around Oxford.)
- If all the benefits were viewed parking space by parking space, or lot by lot, they might seem modest. But the cumulative benefits for an entire community or city are substantial. For example, increasing canopy cover to 50% in all parking lots in Sacramento, CA produces an annual benefit to the community of \$4 million.