

Blending Green & Black: cool urban design in Athens

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ABSTRACT

Sparse vegetation is a major cause of the urban heat island effect. Replacing asphalt & cars with bare soil & greenery is a tactic to lessen that effect and also enhance urban life.

Based on a real case in Athens, this paper presents a practical scheme for converting streets into elongated parks in dense urban areas, taking into account traffic and parking requirements.

1 Introduction

Athens has been a fast growing metropolis, with its population jumping from 1.3 million in 1950 to over 4 million today. Most of the city has grown without coherent planning, to a vast patchwork of dense urban blocks with few green areas. The ills of random speculative expansion are all too obvious today, generating a widespread consensus: the urban fabric of the Greek capital is sagging and needs repairs, above all to boost up urban greenery. There are several proposals on how to achieve that: by creating green pockets after demolishing derelict buildings or perhaps entire blocks, by unifying back yards in blocks and make them green, or by encouraging green roofs.

The green campaign has to face two powerful opponents: first, the sanctity of real property, and second the car dominance in contemporary cities. The first involves costly expropriations, court marathons, and disputes between owners. The latter is linked with the increasing traffic congestion and the rising need for parking space. The antagonism between cars & plants has already caused unrest in cases where old trees were sacrificed for the sake of a new garage.

A number of factors impede the quest for a greener Athens: limited funds, lack of incentives, legal disputes, or speculative forces. But there are more new buildings and cars around us every passing day, air pollution is increasing, the urban heat island is growing, the Athenian 'urban fungus' is eating away the surrounding countryside. Undoubtedly we need practical solutions that are readily applicable now.

2 A real case

Let's see here a real case that perhaps can inspire such solutions, to be applied either in existing settings or in future planning schemes. It is the so-called Papagou 'New Area', near the campus of National Technical University of Athens, 5km east of city centre. It is an area of about 1km², which was planned by a military housing agency in the early 1960s on a rocky scrubland at the foothills of Mount Hymettus (Figure 1).



Figure 1: Papagou New Area.



Figure 2: Fishbone-like streets are separated by groves.

The layout of the area consists of ‘black’ and ‘green’ strips –i.e. linear parks between asphalt streets– with vegetation scattered among the building blocks (Figure 2). Short byways on both sides of each street lead to linear groves of pine trees and wild vegetation, where the only artificial elements on the bare soil are paved footpaths, lighting poles and a few benches (Figure 3). The scheme is actually a simple grid plan with clear separation of cars and pedestrians. The result of this layout is to minimize the distance between buildings and ‘countryside’, plus the creation of pedestrians-only zones without obstructing car traffic.



Figure 3: Green corridors in Papagou New Area between houses. The soil is covered only by seasonal weeds and narrow footpaths made of cement tiles.

3 Possible application

Papagou is a relatively low-density area, with building coefficient of 1.0. Could such a scheme be implemented in denser parts of the city? The idea is fairly simple in construction terms: in every second or third street of a neighbourhood, the asphalt is stripped off, the soil is left exposed, and cars are replaced by trees. Such linear parks between buildings would create continuous pedestrian green corridors, interrupted by major vehicle routes only where absolutely necessary. Figure 4 shows a schematic image of a typical densely built area of Athens before and after such intervention.

The design differs from the usual pedestrian areas or restricted traffic zones. An essential element is to keep the soil completely bare (except sidewalks next to buildings) in order to facilitate the free growth of all kinds of vegetation without special care, as in the countryside. Car access should be allowed only for emergencies and entry to garages. To lessen construction cost, the rubble from dismantling the asphalt etc. could be used for a decorative mound at a nearby open area (like Rubble Mountains - 'Trümmerberg' - in Berlin and other German cities that were made with the ruins of the 2nd World War).



Figure 4: Green lanes in place asphalt in densely built area of the centre of Athens (before, after).

4 Benefits

Such a scheme offers multiple advantages over other alternatives for urban cooling and improving living conditions in the city:

- Streets are public property, so there is no need for costly and lengthy expropriations. For the same reason, there is no need for agreement between joint landowners, building rights transfer, reparations, court appeals, etc.
- Construction is easy, quick and cheap, and so is maintenance later. Additionally, installation and amendments of underground utility networks are highly facilitated.
- The urban heat island is lessened due to reduced asphalt and concrete mass that absorb and emit solar heat. Additionally, shading & transpiration of plants provide substantial cooling at no cost.
- Vegetation reduces airborne particles and replaces CO₂ with oxygen.
- The beneficial effects of vegetation are located on the ground level where the city life takes place, not on isolated rooftops. Moreover, there are no technical difficulties like those associated with green roofs, such as extra structural load at high level (which amplifies earthquake stress), special waterproofing, wind effects on exposed vegetation, limited soil for large plants.
- The waterproofed surfaces of the city are reduced and more rainwater is absorbed by the soil. That diminishes flood risk and supports the water table and vegetation.
- Cars are replaced by plants as major ingredients of the urban landscape.
- Pedestrian domain is widened, offering to children and adults opportunities for leisure and social activities that so far have been suppressed by cars.

5 Problems

Car traffic and parking are key issues to be addressed in such an intervention. With the current dominance of the automobile, any realistic proposal should (a) provide vehicle access to or near each building, and (b) retain the existing parking capacity as much as possible.

In the case of Papagou the cars-per-hectare ratio is low enough to avoid problems, but what about densely populated boroughs of Athens such as Kallithea, Kypseli, or Pangrati? That issue could be addressed by a simple layout like the one illustrated in Figure 5, where local traffic loops facilitate the movement of vehicles without reversing. At the same time, the existing capacity of street parking remains almost intact.

6 Conclusion

Green corridors can easily be incorporated into Athens, offering coolness and leisure areas with negligible burden to public budgets and car traffic. This paper does not suggest a specific proposal, since there are many details to consider in each particular case. It simply presents a generic idea that could be applied in actual projects. The residents of Papagou can surely certify the benefits of such a ‘black & green’ layout.

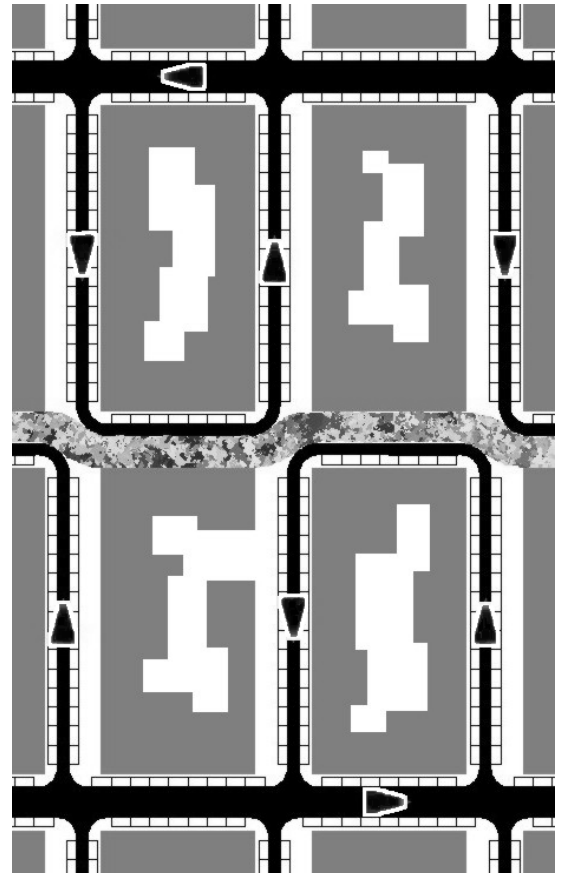


Figure 5: Traffic loops around blocks with street parking at both sides. The green corridor continues unbroken between loops.