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TREE CONSULTANCY

Highways, trees and people: time to move on

The AA ArbNews (Winter 2015)

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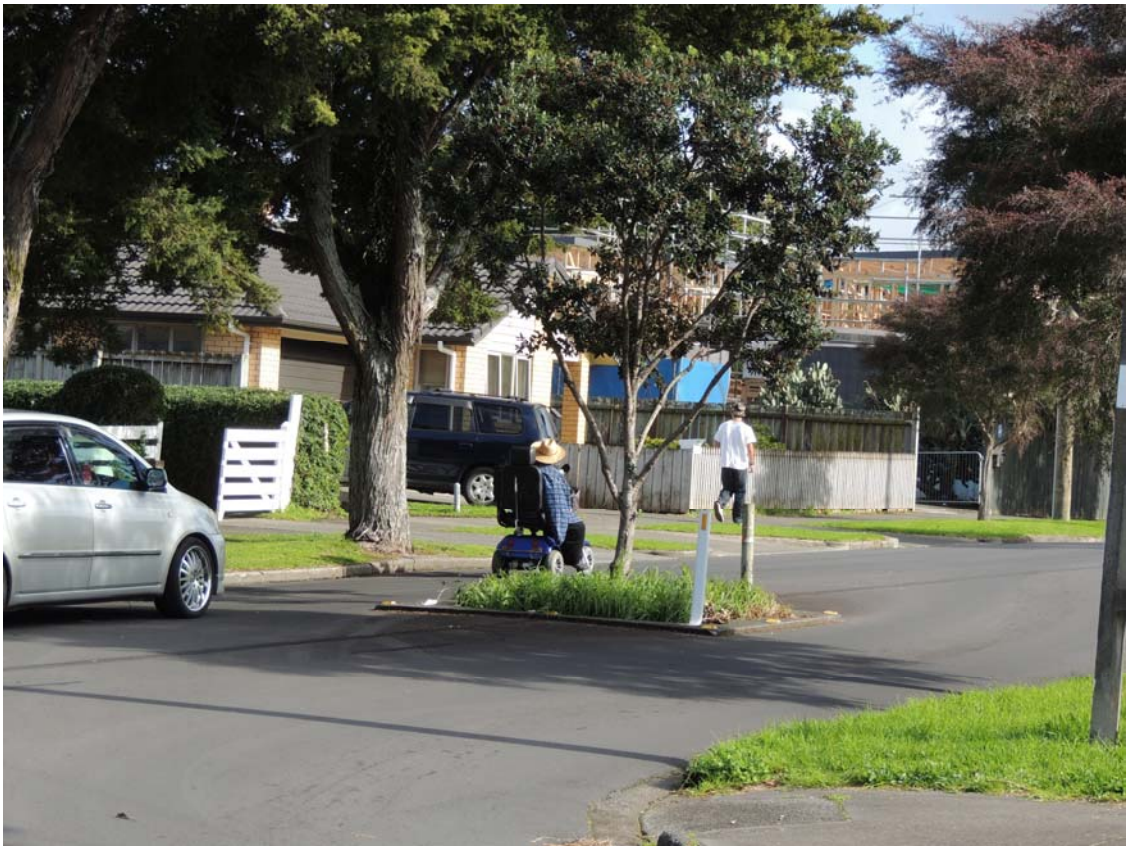
Anyone travelling along Britain's modern rural motorway and trunk road network cannot fail to be impressed at the amount and extent of tree cover lining the carriageway; it is visionary, successful and a world class example of long term planning at its best. Quite surprising then to find the complete opposite along many of our older secondary roads and urban streets, where tree cover is often sparse or non-existent. The obvious excuse is that there is less space in towns, but perhaps a more sinister reason lurks behind that facile façade. There is increasing evidence that highway authorities are adopting a presumption to remove existing trees and not to replace, rather than maintaining or expanding highway canopy cover. The current generation of highway engineers are presiding over local decisions that benefit their own narrow objectives, to the detriment of the wider population, which is being deprived of the benefits that tree-lined routes can deliver.



Research is showing that trees within residential highways at Glen Innes, Auckland, have reduced vehicle speeds and accident rates compared to similar surrounding areas without the tree planting.

Money drives the mindset, with a focus on reducing immediate costs at the expense of less obvious benefits. Historically, it has been difficult to monetarise much of the value that trees offer, which is convenient for the accountants, offering them a platform for ignoring the long term benefits in pursuit of balancing the books in the short term. For the highway middle-managers, with a keen eye on coasting to retirement without rocking the boat, there is little incentive to interrogate the conventional wisdom that trees are bad for business; they damage infrastructure, they cause accidents by restricting visibility and they kill people who drive into them! Myths they may be, but entrenched they are; just the perfect foil to keep things the way they have always been.

This highways culture of living in the past is throttling aspirations for a green future, but emerging research and experience is beginning to challenge that traditional perspective. There is an increasing body of evidence demonstrating that, far from detracting from desirable highway objectives, trees can significantly enhance the prospects of meeting them. It seems that trees near roads buffer particulate exhaust pollution right at its source, with big benefits to health; trees as street furniture seem to reduce vehicle speeds and accident rates in residential areas; and, attractive tree lined routes significantly encourage public transport, pedestrian and cycle use.

The evidence base that more trees deliver big highway benefits is accumulating and yet we are not seeing that translated into increased canopy cover along our urban streets. Indeed, the reverse seems the norm, so why is that and, more importantly, what can built-environment professionals do about it:

- **Resistance to change:** It is human nature to feel comfortable with what you know, and to fear any changes introducing the unfamiliar, threatening the security of knowing what to do. This creates a huge resistance to change; "*we've always done it this way and we're not changing*" is a powerful argument, which often prevailed in the past! But, our world is changing, and fast; ever decreasing budgets mean everyone has to do more for less; information technology makes people better informed than ever before and less tolerant of entrenched management; and, an increasing awareness of the importance of sustainability is imparting greater expectations for efficiency in all walks of life. Change is the new reality and it will not be long before those locked into the evolutionary dead-end of "*business as usual*" will be confined to the fossil record. Thankfully, not much more to do on this front, it is already happening and it is unlikely to stop!

Retrofitted people-calming in Leonard Circus, Hackney; old spaces revitalised by visionary highway management.

- **Inappropriate cost model:** One of the most frequently cited reasons not to plant trees is the cost, but this is only one side of the equation. The position has superficial traction because the bulk of the costs are early in the tree lifecycle, so supply, planting and support through to independence in the landscape. The depth this fails to account for is the multiple benefits trees provide, the value of which increases exponentially as they increase in size, paying back those initial costs many times during decades of delivering goodness (Figure 1). Traditionally, tree supporters have failed to articulate this net gain over the life of the tree, which makes it an aspect in need of urgent attention. With the imminent arrival of the UK-tailored i-Tree programme, there is now a credible mechanism for monetarising tree benefits, which has always been the most daunting obstacle. This is important because the sooner we can put a realistic pound value on tree benefits, the sooner we can begin to challenge the highway engineers who are refusing to embrace trees as an essential part of highway infrastructure.
- **Sustainability-busting highway authority adoption protocols:** Highway engineers routinely adopt trees in highways, but they demand a commuted sum payment to cover future management costs. However, they are often locked into outdated cost models that are squeezing the life out of built-environment professionals trying to design green

infrastructure into new developments. Highway adoption engineers demanding unrealistically high commuted sums for trees are a barrier to tree planting; great for their local budgeting, but a sustainability disaster for the wider community, which is being deprived of a green and comfortable future. The proof is easy to find; developers designing trees into streets only for over-zealous highway engineers to apply excessive adoption fees, forcing new trees into private gardens or being removed altogether. This is silo-mentality at its absolute worst; balancing the books for the few at the expense of the many. Another very good reason for a credible tree cost/benefit model.

- **Poor highways and planning interface:** Still on the new development and the silo-mentality themes, for planning to work effectively, there is an obvious need for all the stakeholders to be involved from the beginning. It would seem sensible to have adoption highway engineers in at the start of a project to hear the case for trees and state their objections to them, but that rarely happens. Instead, they are often the last to be consulted, wielding the axe before a single tree is planted and ruining all the green aspirations of the design team. To be clear, this is happening on a daily basis around the country; another example of localised agendas undermining, if not destroying, our national climate adaptation effort.
- **Damage to services and surfacing:** Another frequently cited reason not to plant trees in streets is that they damage surfacing and service infrastructure. The reality is that the potential for damage exists and it does occur, but advances in modern technology and species selection means that the bulk of the risk can be designed out of new planting. On the bright side, there is an increasing acceptance from utility providers that services and trees can co-exist, with a useful review set out in the Trees & Design Action Group's (www.tdag.org.uk) latest publication *Trees in Hard Landscapes* (Section 3.4 Underground utilities). Of course, there will always be some situations where it is not appropriate to plant new trees because of the potential for damage, but these are the minority, not the majority, and should not present an insurmountable obstacle to enthusiastic urban tree greening.
- **The importance of case studies:** Visionless middle managers are a barrier to progress, with their obsessive drive for self-preservation thwarting the best efforts of government at a strategic level, right down to tree enthusiasts on the ground. One effective counter to this bulbous negativity is to challenge resistance with examples of where creative approaches have resulted in successful outcomes. Documented case studies of where a new idea has worked, published online for all to access, undermine the doubters and empower the enthusiasts. This is a modern tool with great potential to extinguish this outdated mindset because of the enhanced dissemination that the internet offers.

Highway futures here today in Lyon, France; planned integration of pedestrians, cyclists, vehicles and trees.

From a climate change adaptation perspective, highways are a big source of human discomfort; poisonous gases, harmful particulate pollution, sweat-inducing heat storage and flood-causing rainwater runoff, being the most obvious. Adverse impacts from highways are clearly damaging the health and wellbeing of urban communities, and yet the message that tree planting significantly reduces the harm just isn't getting through to the bulk of highway engineers. Despite the increasing and credible evidence base supporting the case for more trees, national government seems unable to affect a change in entrenched highway management culture. Indeed, if society is to benefit from greener streets, it seems that the initiative will have to come from other built-environment professionals, so here are two things that we can do right now to make a difference:

1: Individual action – be familiar with and use *Trees in Hard Landscapes* as a force for change

Through the Foreword by Baroness Kramer, the 2014 Minister of State for Transport, this document provides current and useful guidance with obvious government-endorsement. Furthermore, it is supported by the Institution of Civil Engineers, the Chartered Institution of Highways and Transportation, and the Chartered Institution of Building Services Engineers. This weighty provenance introduces a series of practical case studies that all uninformed highway engineers should be confronted with, the most pertinent of which include:

- **Tree planting increasing use of public transport:** Case Study 12 (Whiteladies Road, Bristol) demonstrates an increase in bus and cycle use following street tree planting.
- **Tree planting encouraging walking and cycling:** Case Study 7 (Wirral Green Streets Programme) encouraging walking and cycling by creating attractive tree lined routes between residential and employment areas. Case Study 14 (Palatine Road & Powerscroft Road, Hackney) where linear orchards were planted along residential streets to improve the cycling and street environment. Case Study 30 (City of London) where new trees demonstrably increased pedestrian and cycle use.
- **Tree planting reducing traffic speeds and accident rates:** Case Study 13 (Glen Innes, Auckland) where a three-year research project identified a significant reduction in vehicle speeds and accidents where residential roads were planted with trees, some in the carriageways. Case Study 15 (Leonard Circus, Hackney) where trees were planted in the highway to create shared space for pedestrians, cyclists and motorists.
- **Trees improving air quality and cooling:** Case study 10 (Garibaldi Street, Lyon) where an active research project is quantifying the cooling effects of street trees through evapotranspiration. Case Study 32 (Church Street and Paddington Green, Westminster) is an urban regeneration project where the close integration of trees and highways is a central theme in providing healthy and cool living conditions.

TDAG is currently compiling a list of even more case studies, so follow it on Twitter to find out when those will be available online.

2: Group action – develop a street tree cost benefit model (Figure 1)

It would greatly assist all built-environment professionals and tree enthusiasts alike to have a credible, but simple, cost/benefit model (Figure 1) to challenge the highway

engineers that refuse to consider the case for trees in a balanced way. The data to create such a model already exists, but so far, there has been no coordinated initiative to collate it, scientifically verify it and then actively promote its incorporation into mainstream urban infrastructure management. Such a model would certainly be in the national interest because it would facilitate a more balanced and informed decision-making process. It would be an obvious project for central government, but we need it now, not in five years' time when the politicians finally wake up! In the absence of any political initiative, it seems that the most effective way to make progress will be through a collaboration of built environment organisations to adopt it as a priority project. It is urgently needed, so sooner than later would be preferable!

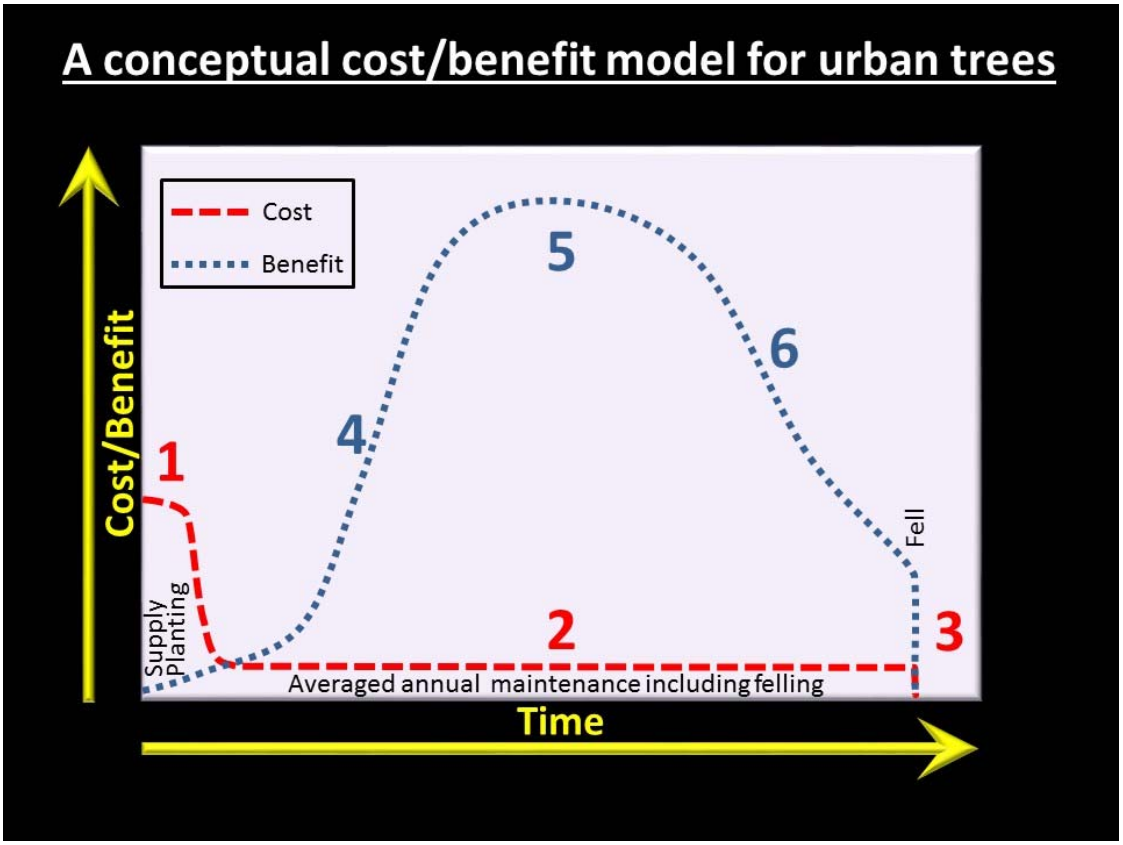


Figure 1: A cost/benefit model for urban trees is likely to show the highest costs at supply and planting (1), with much lower averaged annual maintenance costs (2) up to and including felling (3). In contrast, the benefits would be low at the time of planting, but soon exponentially increase with size (4) to peak and stabilise as the tree reaches maturity (5), gradually tailing off as the tree declines (6) and is finally felled. We suspect that the total costs (the area beneath the red dashed line) is much less than the total benefits (area beneath the blue dotted line), but an academic analysis is urgently needed to put reliable figures to the model and empower the tree planting lobby.

To finish on a positive note, there is an interesting initiative in the Midlands called the 6Cs Design Guide Review (http://www.leics.gov.uk/htd). The 6Cs Design Guide, conceived in 2004, deals with highways and transportation infrastructure for new developments in areas for which Derby City Council, Derbyshire County Council, Leicester City Council, Leicestershire County Council and Nottinghamshire County Council are the highway authorities. It is currently being reviewed with the help of a consultation panel, on which TDAG has a place. The Review Group met for the first time last month and there was an encouraging disposition from both planners and highway engineers towards a more realistic integration of trees into the updated document.

These initial discussions revealed a broad acceptance of the benefits that trees have to offer, and a willingness to listen to the case for more new planting. In highway terms, this is a progressive approach to coordinated highway planning and is being widely hailed as a model of good practice for others to follow. If trees are properly factored into the decision-making process set out in this document, then the prospects for those principles to be carried forward into other initiatives are very good. This is a promising start, but there is still some work to do before we will routinely see UK trees being given an equivalent status to other highway infrastructure.