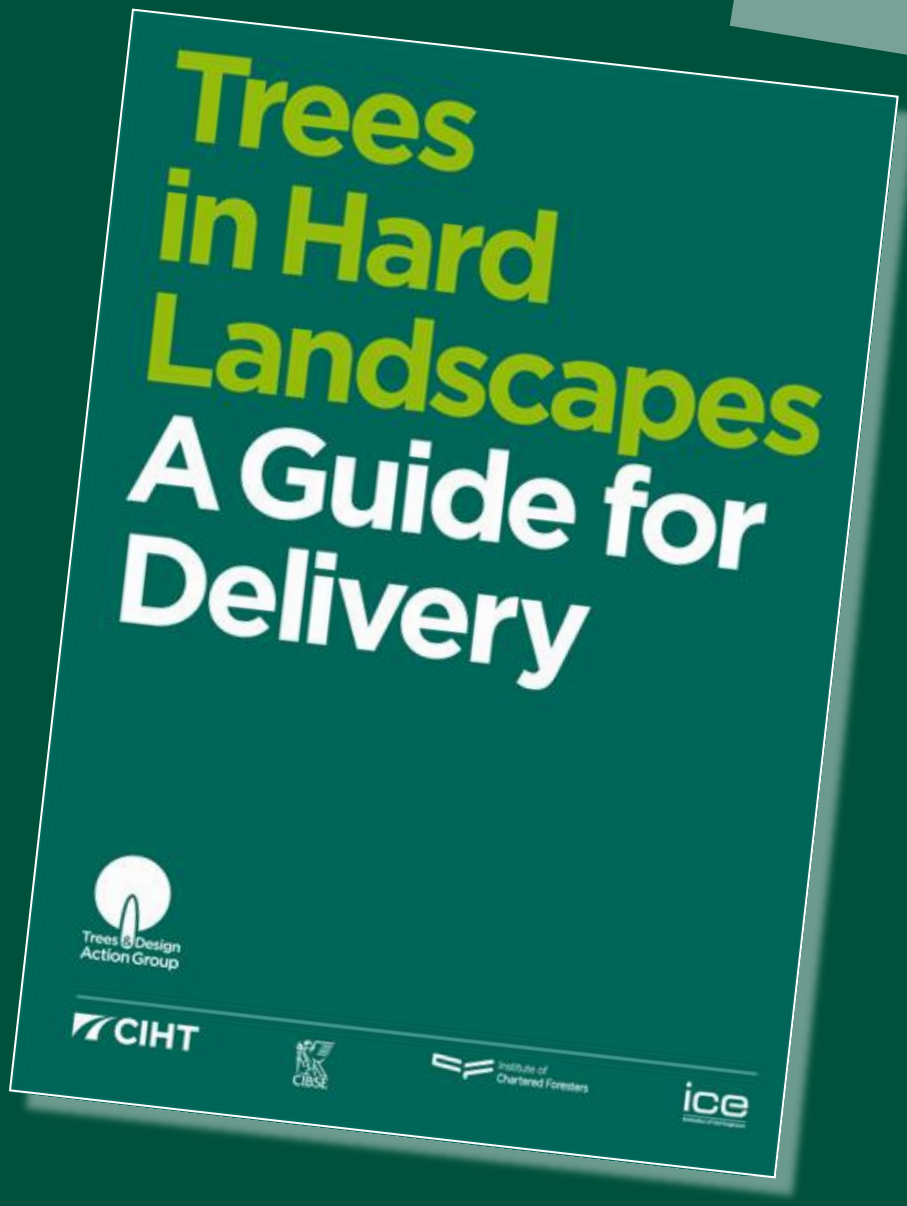
Trees in Hard Landscapes

What's in it for Scottish Cities?

22.06.2015 | City Halls | Glasgow

WHY?


Trees in Hard Landscapes
A Guide for Delivery
Trees & Design Action Group
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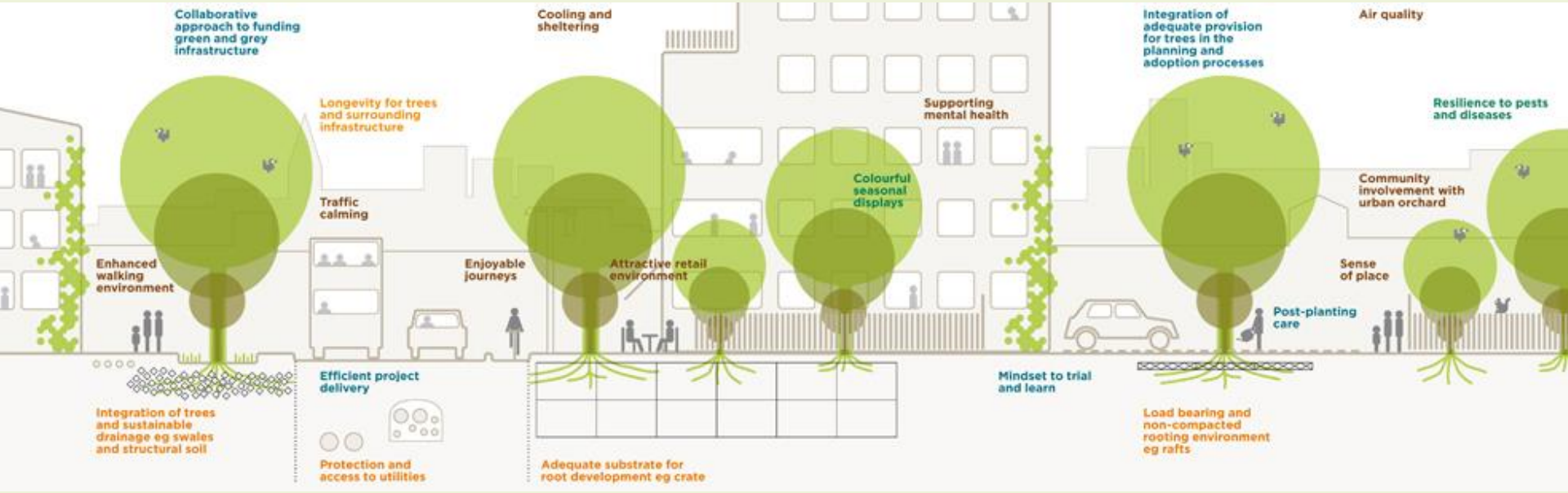


Designing below-ground

Technical Design Solutions

Working solutions: Skeleton soil installation process for existing trees

Excavations start on Kornhamnstorg a public square in Stockholm's old town where lime trees show early sign of decline.

Large stones for the skeleton soil layer are being positioned and compacted in the newly created continuous trench.

Some roots have been pruned. Excavation and soil clearing near the root ball is carefully conducted with non-invasive tool.

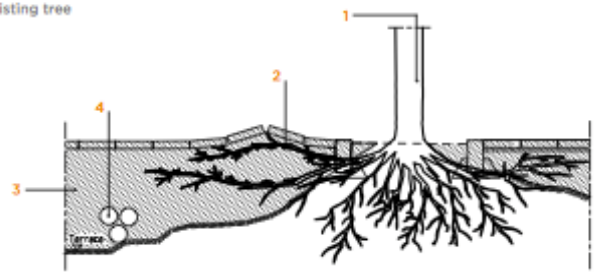
High quality soil is applied around the pruned/cleared root balls. Notice the root deformations caused by deep concrete casing used in the earlier planting hole design.

Root balls with new soil under protective cover and irrigation (notice the green watering bag around each tree). More soil is being flushed into the skeleton soil.

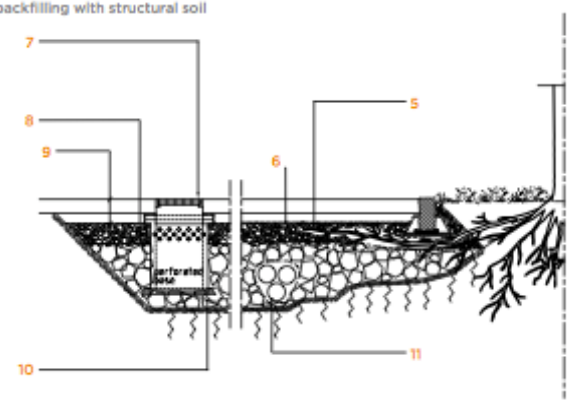
It includes an aeration well, to be capped with a grate sitting flush with the paving.

inlet between the two foreground trees.

Section for excavation around an existing tree



Section backfilling with structural soil



1. Existing tree
2. Vacuum excavation 2-3 m radius from tree trunk
3. Existing superstructure excavation to 1m
4. Existing pipes
5. Pruning tree roots:
   - big roots protected with crushed rock 32-90mm
   - root[illegible] structural soil protected
6. Geotextile
7. Air and water supply
8. Aerated bearing layer
9. Surfacing superstructure
10. Structural soil with planting soil and fertiliser
11. Pipes in structural soil protected with geotextile

tree [illegible] shallow
[illegible]refurbishment
[illegible] the same approach

is used. Image: Municipality of Stockholm

Images:
Björn Embrén

Visualising solutions

Working solutions: Installation process for various crate systems

Placing the crates, accommodating the water main (see Case study 9, p38).

Filling the crates with tree soil.

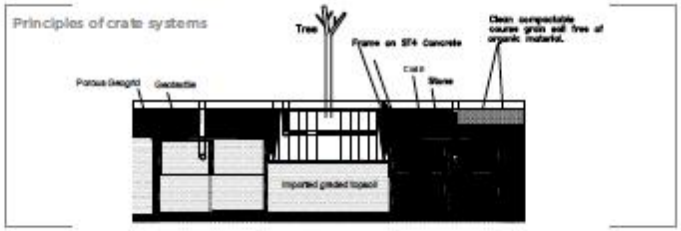


Image: Monson and DeepRoot

Two above images: Martin Gammie

Positioning concrete crates on prepared island base at Apeldoorn station square (see Case study 24, p127).

Excavation is starting along Ocean Road (see Case study 2, p31).

Compacting base and placing crates.

Placing cellular units around concrete crates.

Island ready for soil fill.

Understanding options

Whiteladies Rd, GBBN, Bristol

Case study 12, p72

Bus patronage +40% (2008/09 - 2012/13)

User satisfaction 27% -> 81% (2008 - 2012)

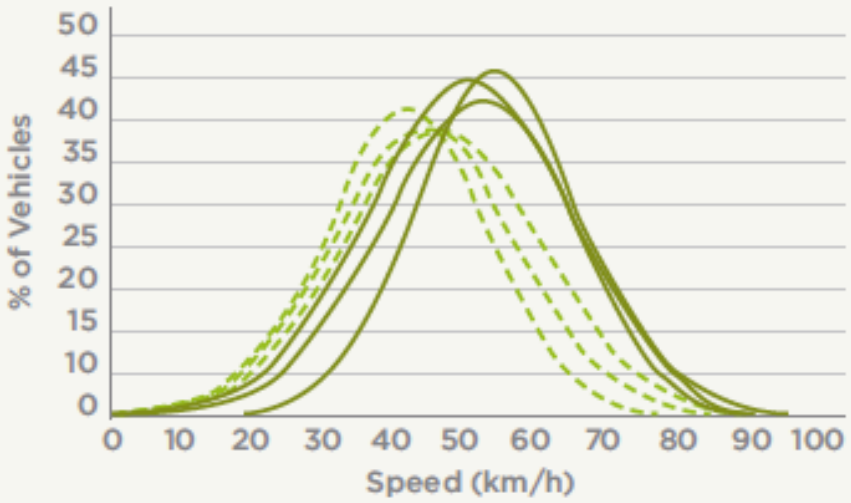
Cyclist count +13% (2007 - 2012)


Glen Innes, Self-explanatory Road
Case study 13, p73

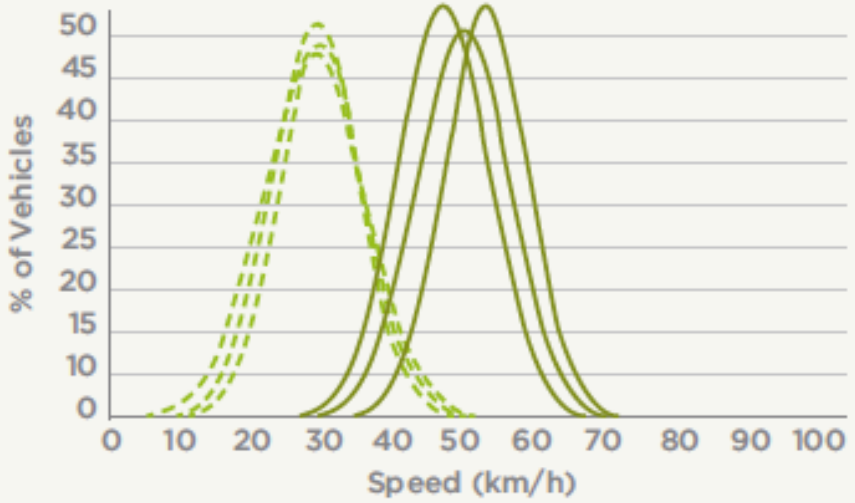
Speed reduction curves

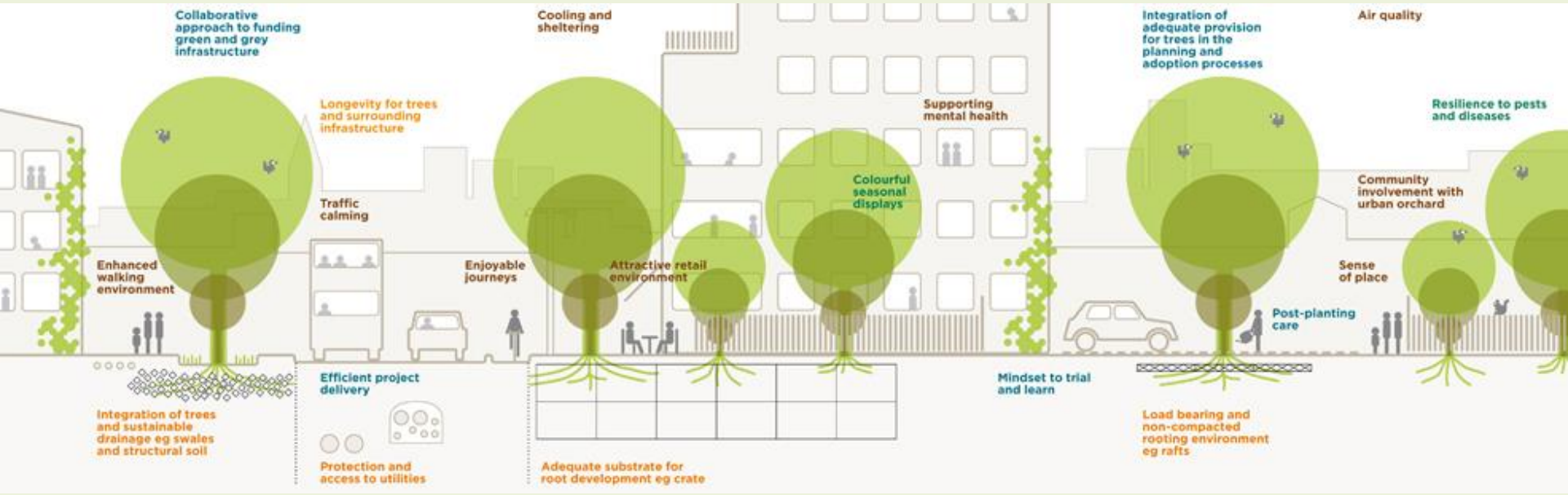
--- Local Road —— Collector Road

Pre-Treatment



Post-Treatment

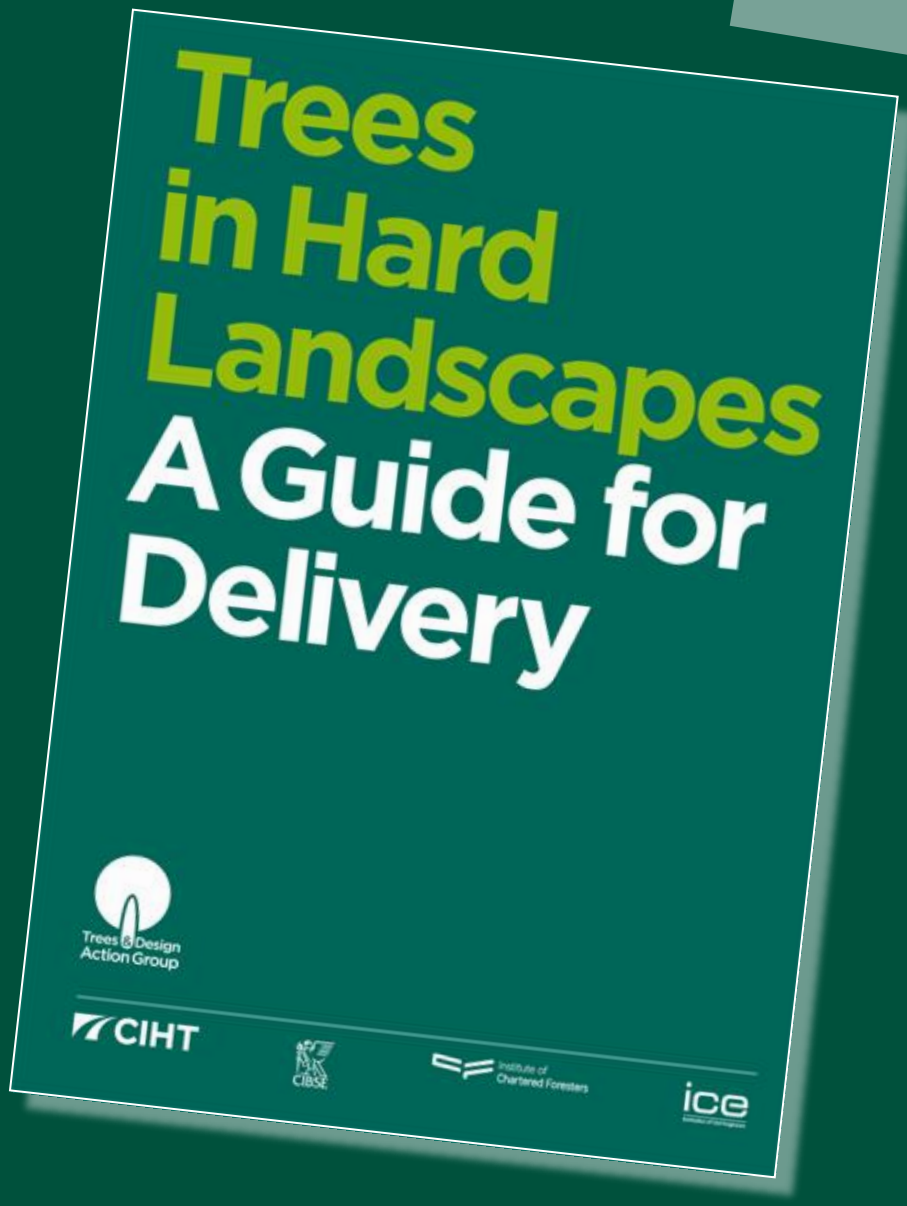




Enabling factors

Designing with Trees

WHY?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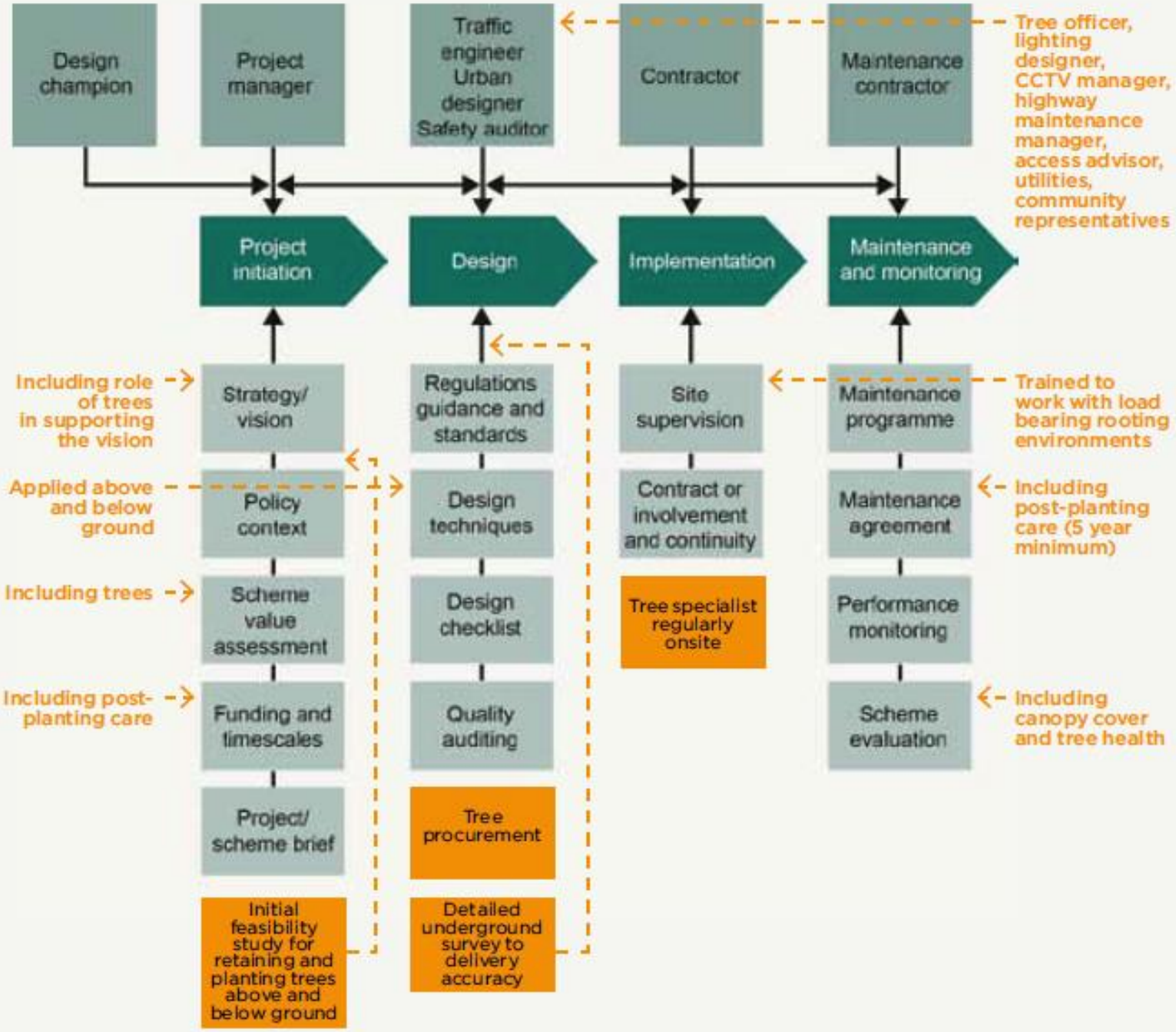
Collaborative Process

Integrating trees into the LTN1/08 design process, flow, inputs and outputs



1.1
A good start: leadership, project team and funding

In brief: what needs to be done	Who does it
Have clear policies for the protection, care and planting of trees and commit to their enforcement.	– Planner/policy officer – Design champion/Client representative(s) – Tree officer/specialist – Project manager
Articulate the value of existing and proposed trees in the scheme value assessment.	– Design specialist(s) – Tree officer/specialist – Project manager
Articulate the benefits of existing and proposed trees bring to achieve the project vision and objectives.	– Design specialist(s) – Tree officer/specialist – Project manager
Secure access to the right skills for the team, including, where needed, expertise on soils, veteran trees, young trees, arboriculture, urban forestry.	– Design specialist(s) – Tree officer/specialist – Project manager
Incorporate five years of post-planting care in capital project costs.	– Project manager – Client representative(s)
Take a partnership approach to funding.	– Project manager – Client representative(s)

1.1.1
The need for vision and leadership

Terms defined in the Glossary found on page 156 are highlighted in green throughout the document

Whether in private or public organisations, establishing a culture of collaboration where there is pride in the inclusion and preservation of trees requires leadership and vision (see *Trees in the Townscape* Principle 9, pp56-61).

In practical terms, this requires:
- Clear standards for the protection, care and planting of trees in the local plan and/or other key policy documents, including local transport plans, highway design guides and supplementary planning documents addressing trees in new developments. Such standards may equally be set by private organisations in corporate policy documents (see the examples of Land Securities on p23 and Tor Homes on p25 in *Trees in the Townscape*).
- Personal commitment from the elected and/or executive team to the policies and standards set.

In high profile schemes to transform an area, top-level leadership will likely rely on the vision brought by local politicians. In standard schemes, the director of planning or the director of highways will have a key role to play. In all instances, ensuring the management director or relevant account manager of the company building or overseeing construction will be critical. This is through the stages to convey to them the:
- Adhere to design and construction practices to facilitate successful tree growth and retention.
- Have funds available for post-planting care.

Beyond robust policies and executive commitment, integrating trees in hard landscapes also relies on leadership at staff level, including:
- Arboricultural or design staff who actively engage in policy work to articulate the relevance of trees within broader strategic policy or business agendas.
- Arboriculture and highway staff who are confident and collaborate in overseeing operational and construction work.
- Arboriculture and highway staff who share an interest in and appetite for innovation and learning. Flexibility in the use of specifications featured in local design guides in response to project circumstances and new techniques becoming available is critical. This ensures that contemporary approaches such as those designed to enhance the tree-rooting environment beneath load-bearing hard surfaces (see 3.2) can be explored and, if appropriate, trialled locally and accepted.

As the LTN 1/18 diagram demonstrates, an important element in delivering successful projects is to have a single project champion who takes the project from concept to completion.

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Action oriented

Quick Check

Are all key parties engaged in the collaboration required for success?

Design champion/Client representative(s)
Have you...

- ○ Got clear policies for the protection, care and planting of trees and are committed to their enforcement?
- ○ Communicated to the team the importance of the inclusion of environmental improvements, especially trees, for your vision of the project?
- ○ Ensured the project brief, the team composition and the budget allocations will effectively support this vision?
- ○ Before signing off design, checked that a consensus has been reached among the team on a detailed solution for successful integration?

Local authority planner
Have you...

- ○ Sought expert guidance (from both a tree specialist and relevant references, such as *Trees in the Townscape*) to draft/update tree policy?
- ○ Communicated tree protection, planting and care policies as well as associated site-specific requirements right from pre-planning meetings?
- ○ Put conditions in planning approval to require survey proof confirming that the planting scheme is deliverable?
- ○ Ensured effective enforcement of tree-related requirements?

Project manager
Have you...

- ○ Ensured the vision for the contribution trees make to the project objectives is well articulated as well as the value of using i-Tree Eco during consultation with members, other decision-makers and the wider public for project sign-off – making use of tree valuation and visualisation techniques, as appropriate?
- ○ Ensured the right tree specialists and soil scientist have been commissioned?
- ○ Facilitated a collaborative approach to funding tree-related enhancements, exploring all potential sources as described in this guide?
- ○ Budgeted five-year aftercare for newly planted trees as part of the capital investment programme?
- ○ Explored advanced procurement with the design specialist(s) (in this case the [illegible]chitect) [illegible] precisely the right [illegible]
- ○ Ensured the team composition includes the right [illegible] – this might [illegible] short-term de[illegible] or large projects?
- ○ Conducted the right underground surveys at the right time: initial survey from site visit and utility asset database at project initiation, and delivery accuracy survey at the beginning of the design phase?
- ○ Ensured all necessary negotiations with statutory authorities have been carried out?

Checklists to recap

Case study reference		Location	Page	Context: Arterial street	Context: High street	Context: Residential street	Context: Public square	Context: Car park	Design objectives: Provide a setting for regeneration and growth	Design objectives: Slow vehicular traffic	Design objectives: Enhance the walking environment	Design objectives: Extend the cycle network	Design objectives: Enhance public transit	Design objectives: Remedy conflict between trees and surroundings	Design objectives: Manage or recycle surface water runoff	Design objectives: Reduce urban temperatures	Use of load-bearing or load-spreading tree planting solutions: Structural growing medium: sand	Use of load-bearing or load-spreading tree planting solutions: Structural growing medium: medium-size aggregate	Use of load-bearing or load-spreading tree planting solutions: Structural growing medium: large stones (Stockholm system)	Use of load-bearing or load-spreading tree planting solutions: Crate system	Use of load-bearing or load-spreading tree planting solutions: Raft system
1	Melbourne's urban forestry programme	Melbourne, Australia	30	•	•	•	•		•						•	•					
2	Supporting retail on Ocean Road	South Tyneside, England	31		•				•		•									•	•
3	New trees at Chobham Manor Phase 1	Stratford, England	32			•			•												
4	Stockholm system in the USA	Minneapolis, MN, USA	33			•			•										•		
5	Specimen trees in Dortmund Square	Leeds, England	34				•							•						•	
6	The Angel Building – unlocking planning	Islington, London, England	35	•					•												
7	Wirral Green Streets Programme	Birkenhead, England	36	•		•			•		•	•									
8	Bath Road integrating trees and highway	Bristol, England	37	•									•								
9	Trees in public car park, Henley-on-Thames	Henley-on-Thames, England	38					•							•					•	
10	Green-grey-blue infrastructure in Lyon	Lyon, France	39	•							•	•			•	•			•		
11	Reclaiming road space for trees	Lyon, France, London, England	71	•	•	•	•	•	•		•	•	•								
12	Enhancing road safety and bus journeys	Bristol, England	72	•	•				•				•								
13	Improving safety in Glen Innes	Auckland, New Zealand	73			•				•											
14	Linear orchards for cycling route	Hackney, London, England	74			•						•									
15	Shared space and trees in Leonard Circus	Hackney, London, England	75				•				•	•			•					•	
16	Revitalising retail	Bristol, England	76	•	•				•				•								
17	Rainwater harvesting for irrigation	Lyon, France	77	•							•	•			•	•			•		
18	Tree-lined boulevard in Swansea	Swansea, Wales	122	•					•		•						•				
19	Trees and resilient footways, Slaney Road	Walsall, England	123			•								•				•			
20	Existing and new trees in skeleton soil	Stockholm, Sweden	124	•	•									•					•		
21	Tree-lined gateway to Aberystwyth	Aberystwyth, Wales	125	•					•										•	•	
22	St George's Street plaza	Norwich, England	126				•		•	•	•									•	
23	Retrofitting tree-lined cycle lane	Hengelo, The Netherlands	126	•										•					•		
24	A pine forest for Apeldoorn station square	Apeldoorn, The Netherlands	127	•								•		•							•
25	Managing roof runoff with trees	New Forest, England	128					•							•					•	
26	Improving the environment, Hornsgatan	Stockholm, Sweden	129		•						•				•				•		
27	[illegible] links, East Walworth	Southwark, London, England	[illegible]		•	•				•	•				•				•		
28	[illegible] Creek	London, England	131			•				•	•				•						
29	[illegible]	[illegible] Scotland	[illegible]		•						•					•					
30	Tree choices to suit microclimate, Cheapside	City of London, England	148		•				•	•						•					
31	Tree diversity and local identity	Lyon, France	149	•	•	•	•	•													
32	Climate resilience in Church Street	London, England	150		•	•			•		•				•						

Case study finder p154-155


Collaborative Process
Designing with Trees
Design objectives/ brief
Multiple benefits
Technical Design Solutions
Species Selection Criteria

YOU can make a difference