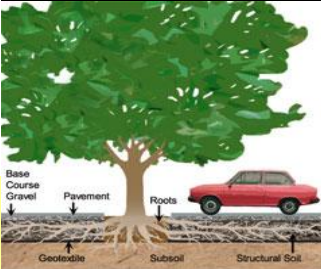


Issue:		Imperviousness and Tree Canopy	
Action Tool Title:		Soil Engineering	
Description of the tool:		Soil engineering intends to structure the soils at project sites in such a way that they are capable of supporting the weight of pavement and vehicles while allowing for adequate root growth for trees, and to facilitate the infiltration, storage, and recharge of stormwater. Soil engineering within the development site can also be designed to direct water under the pavement to a structural-soil reservoir, where it is held until it either infiltrates into the underlying soil or is absorbed via tree transpiration.	
How Well Does It Work?			
How valuable is this tool? How important is its contribution to achieving North Texas' vision for the future?			
Developing green infrastructure technology to protect water quality from contaminants in urban runoff is critical if sustainable communities are to be created, especially now that land is being developed at a faster rate in the DFW region. This tool addresses some of the water-related issues of sustainability.			
How does it actually work?			
When constructing parking lots and side streets, two or three feet of the topsoil is scraped off, and the remainder is compacted and filled with layers of rock and then asphalt. Although the compacted soil keeps out moisture and provides good support for the pavement, it works against a healthy environment. Trees, which are typically planted in soil islands throughout the lot, cannot stretch their roots into the dirt, nor reach their full canopy potential. The hard soil also promotes contaminated runoff and other pollution. Soil engineering will therefore help in mitigating urban runoff as well as improving urban tree canopy.			
What are the costs and who will they affect?		What are the benefits and who will they help?	
Added expenses in project costs		Improved air quality due to the vigorous tree canopy as well as improved stormwater run-off.	
What are the biggest stumbling blocks?		How can they be addressed?	
None foreseen		n/a	
Who Would be Responsible?			
Primary (lead) responsibility		Local governments, private developers.	
Secondary responsibility		None	
Need for coordination			
How Should it be Funded?			
Primary (lead) responsibility		Private property developers	
Secondary responsibility		Incentives from cities	
How Does It Connect?			
What other VNT issues are helped by this tool?		Clean air, water pollution.	
What other VNT issues could be hurt by this tool?		N/a	
How Should It Be Implemented?			
What will be done?		When will it happen?	
<ul style="list-style-type: none"> cities can pass ordinance site design standards requiring stricter rules for runoff mitigation and tree canopy improvement. 		At cities' discretion	
What Examples Can We Follow?			
North Texas Case Studies Other Texas Case Studies Other U.S. Case Studies Supporting Research Related Information		Urban Horticulture Center (UHC) Virginia Tech Grabosky J & Bassuk N (1995), A new urban tree soil to safely increase rooting volumes under sidewalks. Journal of Arboriculture 21 (4) 187-201 http://actrees.org/site/stories/engineered_soil_greens_up_parking_lots.php	
Acknowledgements		Vision North Texas Water/Natural Assets Team	