From:	Lance Young
To:	City Council
Subject:	[EXTERNAL] MRU-70 exemption discussions July 30th
Date:	Sunday, July 29, 2018 8:59:31 AM
Attachments:	Mur-70TreeCode.pdf CanTrees ReallyCool.pdf

To: Shoreline City Council Members
Re: MRU-70 exemption discussions July 30th

Dear Council Members

Please see the attached letter regarding your deliberations over rather or not to exempt property zoned as MRU-70 from Shoreline's tree preservation codes. Also included is one of the articles mentioned "Can trees really cool our cities down". Perhaps particularly relevant on this sunny hot Sunday.

Thank you as always for your careful consideration and deliberation.

Lance Young
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Interurban Trail Tree Preservation Society

14810 Linden Ave N; Shoreline, WA 98133

July 29th 2018

Dear City Council

It was encouraging to hear of the urban forest canopy increase last council meeting which is at least partly due to the Aurora project, and right of way trees we planted there. Everyone can and should pat them selves on the back for this progress! However the biggest concern from Mr. Friedi's presentation was the projected 6% canopy loss from the two new transit stations/lines coming soon effectively wiping out all of our gains. Further bad news is that these trees are mostly on DOT land and they are not intending to replant anywhere near Shoreline. Incidentally, these losses will be in the same areas most affected by the MRU-70 issue under discussion this Monday.

I would like to provide some information for your consideration regarding the MRU-70 zone exemption you are discussing this Monday July 30th. The primary issue at hand is whether or not to exempt properties zoned for seven story structures from Shoreline's city tree preservation codes. As usual this is a balance between competing interests: those of the property developers who want/need to maximize return on property investment, and the environmental/livability needs of Shoreline residents as the city grows.

One of the primary problems and a significant expense for developers of high rise structures is the foundation and parking garage part of the project. This structural element requires a lot of space to allow ingress egress turning radius, possibly ramps and parking stalls. It also typically needs to be concrete for fire and strength reasons, while the rest of the structure can be wood or steel... (wood only up to a limit of about 7 stories currently). So there will be times when the 20% minimum tree retention requirements (SMC 20.50.350 B.) may make it difficult or impossible to develop the property. These few instances are only after 80% of the existing trees have already been removed and the unfortunate 20% remaining are in the middle of the property.

The other side of this is of course that we all love our trees and value their benefits to our community: clean air and water, wildlife habitat, sound abatement, carbon sequestration, mental and physical health benefits. On a hot summer day a single small 4 m. high tree provides the same cooling effect as two small air conditioners through evapotranspiration, and it does this for free! (see Professor Roland Ennos UK, "Can Trees Really Cool Our Cities Down"). One study looking at 30 variables affecting commercial occupancy rates, found that landscape amenities have the highest correlation with full occupancy, greater even than direct access to arterial transportation (professor Wolf, Center for Urban Horticulture)! This is an important differentiation factor for Shoreline, with the current rising glut of apartment space, and increasing vacancy rates.

The problem is how to allow appropriate property development without overly compromising the environment and livability of our city. We do not want to become a tenement center for Seattle like much of North Vancouver has become, or like Ballard is becoming, with sidewalk to sidewalk structures and hardscape. Unfortunately the zoning codes that the City Council establishes become a virtual financial mandate for property developers. Once a lot is zoned for let's say four stories, when it is sold it is priced for this potential and the purchaser then must develop to this level. Any competent real estate agent will confirm that property is priced for its "highest and best use".

Further I find the argument that we should maximize high density development in our cities to prevent urban sprawl/deforestation elsewhere a fallacy. We do not have any control over what other areas do, and to presume that if we increase our density they are going to reduce theirs is unlikely. So it is important to try our best to do right by what we do have control over.

I believe it would be ineffective to provide an exemption and incentives to retain trees for height, parking, and setback bonuses. First it is unlikely anyone will build higher since building costs go up significantly over seven stories according to the Planning Commission, and reducing parking requirements just increases street parking since almost everyone has to have a car, for the foreseeable future, if only for going to the mountains on weekends, or to carry the family groceries home from the store. This increases street parking and necessitates permit only parking neighborhoods.

** What I would like to suggest you consider is a modification to the City's current tree code that provides: an exemption for MRU-70 high rise active construction projects (not just the lot) from the minimum 20% tree retention requirements so long as these trees are replanted, preferably on site, or secondarily replaced off site according to SMC 20.50.360 standards.

Those standards require one to three trees with three years of watering and care, based on the diameter of the removals. If the developer can not replant on site and wishes to pay the City a fee, the cost should be based on the cost of replacement/s and their maintenance (SMC-20.50.360 K.2.) and/or the annual I-Tree value of the lost tree for an appropriate (replacement canopy regrowth) period. I-Tree values are perhaps $35-$45/year for smaller significant trees.

While this would allow the flexibility sometimes needed by the developer, and it would reduce the net loss of forest canopy otherwise resulting from a total exemption, in this already heavily impacted rail station area. Also providing the exemption for only active construction would dissuade property owners from preclearing their lot prior to listing it simply to increase its sale price, and value to potential developers. This would help to attract new residents and retain the quality of life here for them and the many existing residents while not overly impacting the return on investment for the few developers with tree preservation issues.

Thank you for your time, and your consideration of this important issue!
Lance Young
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THE CONVERSATION
Academic rigor, journalistic flair

Can trees really cool our cities down?

December 22, 2015 5.34am EST

Can trees really cool our cities down?

December 22, 2015 5.34am EST

Author

Roland Ennos
Professor of Biomechanics, University of Hull

In cities around the world, trees are often planted to help control temperatures and mitigate the effects of the "urban heat island". But while trees have been called "nature's air conditioners", in practice, scientists often have difficulty demonstrating their cooling properties.

The most obvious way to measure the cooling effect of trees would be to compare the air temperature in parks with that in nearby streets. But this method often comes up with disappointing results: even in large, leafy parks, the daytime air temperature is usually less than 1°C cooler than in the stuffy streets, and at night the temperature in parks can actually be higher.

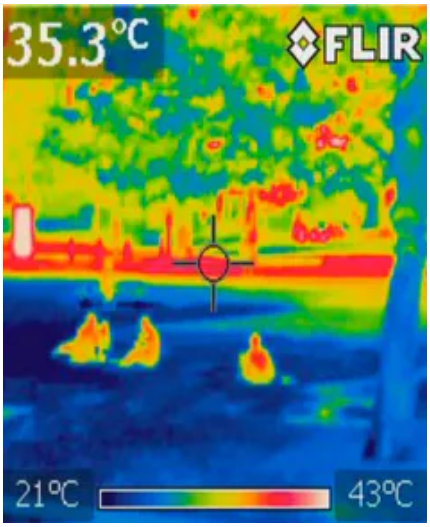
To explain this contradiction, we need to think more clearly about the physics of heat flows in our cities, and the scale of the measurements we are taking.

Shady days

Theoretically, trees can help provide cooling in two ways: by providing shade, and through a process known as evapotranspiration. Locally, trees provide most of their cooling effect by shading. How warm we feel actually depends less on local air temperature, and more on how much electromagnetic radiation we emit to, and absorb from, our surroundings. A tree's canopy acts like a parasol, blocking out up to 90% of the sun's radiation, and increasing the amount of heat that we lose to our surroundings by cooling the ground beneath us.

All up, the shade provided by trees can reduce our physiologically equivalent temperature (that is, how warm we feel our surroundings to be) by between seven and 15°C, depending on our latitude. So it's no surprise that, in the height of summer, people throng to the delicious coolness of the shade provided by London parks, Parisian boulevards, and Mediterranean plazas.

Trees can also cool down buildings – especially when planted to the east or west – as their shade prevents solar radiation from penetrating windows, or heating up external walls. Experimental



Shade cools the ground. Roland Ennos, Author provided

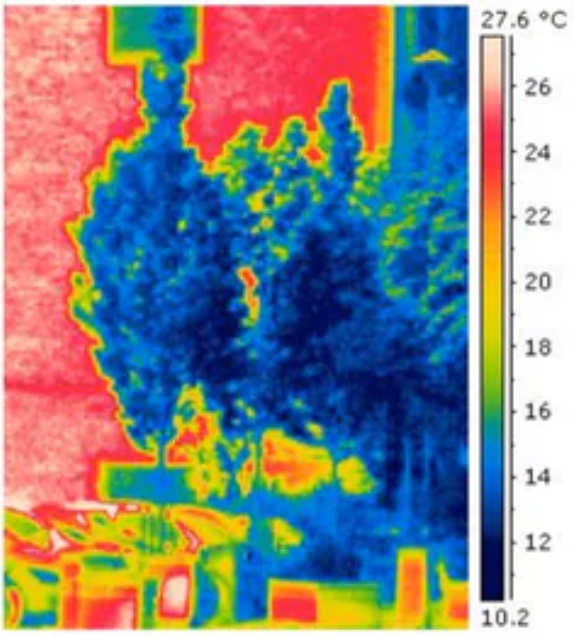
investigations and modelling studies in the USA have shown that shade from trees can reduce the air conditioning costs of detached houses by 20% to 30%.

But air conditioning is more common in some places than in others: for example, while three out of four Australian households have an air conditioner, they're much less common in Northern Europe, leaving the population there more vulnerable to the harms of urban heat. During the 2003 European heatwave, there were 70,000 more deaths recorded, compared with equivalent cool periods. We urgently need more research to find out how much shade from trees could cool down the terraced houses and apartment blocks, where so many less well-off people live.

Beating the heat

Trees can also be used to tackle a bigger problem: the urban heat island. During periods of calm, sunny weather, the air temperature of cities can be raised above that of the surrounding countryside by up to 7°C, especially at night. In cities, the hard, dark asphalt and brick surfaces absorb almost all the incoming short-wave radiation from the sun, heating up to between 40°C and 60°C, and storing energy which is then released into the air during the still of night, when it can be trapped in the narrow street canyons.

Urban trees can counter this process by intercepting the radiation before it reaches the ground, and using the energy for evapotranspiration. Evapotranspiration occurs when the sun's rays hit the trees' canopy, causing water to evaporate from the leaves. This cools them down – just as sweating cools our skin – thereby reducing the amount of energy left to warm the air.



Evapotranspiration in action. Roland Ennos, Author provided

The effects of evapotranspiration can be quantified in two ways. First, you can measure the temperature of the tree canopy, which is typically much cooler than built surfaces – only 2°C to 3°C above air temperature. Unfortunately, we can't really claim that this temperature difference is evidence of cooling capacity; leaves would be cooler than built surfaces even if they weren't losing water, because they are cooled more effectively by convection.

A better method is to calculate the cooling effect of a tree directly, by measuring how much water it is losing. You can do this by measuring the sap flow up its trunk, or the water loss from single leaves. These methods show that tree canopies can divert over 60% of the incoming radiation to evapotranspiration. Even a small (4m high) Callery pear tree – a commonly planted species in Northern Europe – can provide around 6kW of cooling: the equivalent of two small air-conditioning units.

But there's a catch: trees only provide this cooling effect when they are growing well. By measuring water loss from individual leaves, we showed that sparser, slower-growing plum and crab apple trees provided only a quarter of the cooling effect of the Callery pears. What's more, the effectiveness of trees can be greatly reduced if the growing conditions are poor. We found that the transpiration of Callery pears could be reduced by a factor of five, if the roots were growing through compacted or poorly aerated soil. Much more research is needed on the relative performance of large and small trees, whether they're planted on streets or in parks.

One final difficulty in working out the cooling power of trees is to determine how much a given tree's evapotranspiration will actually reduce the air temperature. As so often in science, a modelling approach is needed, with physicists, engineers and biologists working together. We need to put realistic trees into detailed regional climate models, which can mimic the complex daily movements of air and energy through the city. Only then can we determine the regional benefits of the urban forest, and work out how to use trees to make our cities cooler and more pleasant places to live in.

Cities **Heat** **Trees** **Air conditioners** **Heatwave**