Transcript

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Richard Manasseh

All right. Welcome to the last of our sessions-- Trees-- Rooting for a Smart City? My name is Richard Manasseh. And I'm going to introduce our panellists who are new to the floor.

Matthew Daniel. Matthew started out as a climbing arborist and horticulturist for the Launceston City Council. And over 23 years of expertise in holistic tree and soil health has led him to found the company, Global Urban Forest, proprietary limited, where he's presently the CEO.

Stewart Detez started out in the landscape construction industry and found a passion for vocational education. So he is now the manager of the Horticultural and Environmental Technologies teaching team at Swinburne. And Stewart is also a board member, education committee member, and a head judge for landscaping Victoria.

And Scott Rayburg. Scott is a senior lecturer in civil engineering at Swinburne's faculty of Science, Engineering, and Technology and deputy director for digital learning. Now, Scott's research focuses on urban heat islands, urban forests, urban water resources, and water sensitive urban design.

Of course, Nicholas Gruen needs no introduction, so I'll introduce him anyway. Just in case we have any newcomers, Nicholas is a policy economist, entrepreneur, and commentator on economic reform and innovation. He's the CEO of Lateral Economics and chairman of the Open Knowledge Foundation, visiting professor at King's College London.

And Mark Burry-- architect. He's Swinburne's professor of Urban Futures, director of the Smart Cities Research Institute, and recipient of the Order of Australia for his services to architecture. Wow.

And as for me, I'm a mechanical engineer who does research in the mathematics and physics of fluid flows. Singularly unqualified, you might think, to comment on trees, but eminently qualified to start with a very dumb question. So it seems that there are many cities where trees are the exception, rather than the norm. We've all been to them. I've lived in such cities.

Trees occur in parks, but not elsewhere. And yet, these are perfectly functioning cities from an engineering perspective. So it seems trees have a singularly aesthetic function. They don't serve any engineering purpose. Is that the case, Scott?

Scott Rayburg

Is it on?

Should be on.

Hello?

Hello? Oh, there it is. Thanks, Richard. You've been to a city without trees or a suburb without trees and walked around. And how'd you feel in that city? What did it make you think? What did it make you feel? Did it make you get outside to make you be active?

These kinds of places are not places that people really want to be. Even as you walk around Melbourne-- centre of Melbourne has got some fantastic parks as you mentioned. And some of our streets have wonderful trees on them. Other suburbs don't.

And you're really looking at suburbs where people stay inside. They get in their cars and they drive. And they leave those suburbs. They don't want to be outside. They don't want to engage in the community. The sense of community is lost. So there is a benefit directly in terms of our well-being-- our mental and physical well-being that trees provide to us in cities.

But in addition to that, the provocation-- talked a little bit about their engineering benefit. And trees do have some additional benefits to us. If we think about urban heat, which is a research area that I look into, heat kills more people than all of the natural disasters combined. Just think about that for a second. So floods, hurricanes, tornadoes, blizzards, fires.

Heat is killing more people globally than all of those other natural disasters combined. And it's trees that help keep our cities cool. We had a heat wave a few years ago in Melbourne. And we have got a wonderful case study of two adjacent suburbs-- one suburb with 3% tree cover and one suburb with 30% tree cover. And this heat wave lasted about two weeks.

And the people within the tree cover of 30% suburb-- they ran their air conditioners for about two hours in total over that two-week period of time. And within the other suburb, they ran their air conditioners basically for the entire two weeks. So those trees are providing direct benefits to the residents that live in those neighbourhoods. I might stop there and let someone else take over.

Richard Manasseh

Sure. So can I just pose a question, then, to Matthew? Given that trees are providing these engineering services, your drainage as well-- they're reducing the load on storm water drains as well as shade and so forth. Are we treating our urban trees properly?

Matthew Daniel

No. I'll tackle it this way. A city full of sick trees is not going to provide the benefits that we're promoting. Now, how do we assess what are healthy trees? Does anyone know the industry that assesses tree health?

Scott Rayburg

She's got it.

Matthew Daniel

Arborist. Arboriculture.

Do you know how arboriculture assesses a healthy tree? OK, I'll run you through it quickly. Actually, I'll go there. It's basically human interpretation. It's very subjective. The only single metric measure that we use to assess trees is to measure the diameter at breast height. Now, that's to give-- that's for us to determine where we think the root system would be.

And it also helps us indicate the age of the tree. The thing is, is that metric doesn't allow us any real way to actually manage the health of the tree. Now, when you go to a doctor and you've got a health issue, you don't just go to a doctor and he just cuts cancer or a disease out of you.

And essentially, that's how we manage trees in the city. We just cut branches off them. And that's how we manage them. And about 10-- about halfway through my career, I realized, well, that's not how you manage a living asset. It's a living organism.

So I sort of went down the road of trying to identify, well, how do we quantify tree health? So now, I measure photosynthesis, soil microbiology, soil chemistry, soil physical structure, CO2 respiration. All of these metrics to try and determine, how healthy are trees?

Now, that's where we need to get to in the future, is we need to get to this place where we identify trees as living, natural assets and manage them similar to how medicine manages human health. We can't just walk around an urban forest and go, I reckon that tree is sick, and I reckon that tree is healthy. We need to move way past that.

And this morning, I heard a lot about almost too much data. Within the urban forest industry, we don't have enough data. We've got a lot of #nonsensedata. Because knowing the DBH of all these trees in this park is not going to help us understand and manage the health. I'll pull up there, because I can go on all day.

Richard Manasseh

I think we're going to come back to this point about data. But I think we're starting to get the picture that trees provide these services. And these services have value-- air conditioning services, cooling services, drainage control services.

But you've got trees which are certainly in Melbourne on private land. They're providing some benefit to the private owner of that tree, but also, I guess, providing a public benefit. Meanwhile, trees on public land, providing some public benefit, but also, some private benefit. So, Nicholas, who should be paying?

Nicholas Gruen

Good question. So this-- if people-- those people who were here for the last session, I was talking about carbon emissions being a almost perfect example of an externality that's easily internalized. And trees are almost a perfect example of an externality that's quite hard to internalize.

So at least in a kind of-- in principle sense, you want to have a look at this. And use you want to start thinking, well, do we have the incentives? Are things set up right? And I don't know the answer to that. Many of the incentives are cultural if you like. So people like having trees in their backyard. They're likely to plant trees in their backyard.

And those externalities will radiate to-- those external benefits will radiate unproblematically to their neighbours and their neighbourhoods. But it's quite possible that we attend less than we should to trees. And the fact that trees generate such positive externalities. And I'll add something else, which is that I think they generate very—

[BELL DINGS]

I don't think I'm finished yet. I think they generate very non-economic externalities, which is they're quite hard to-- that they feel good. They're nice to be around. And it's quite possible that we wouldn't--

if we were asked to pay for them, that almost in itself can take away some of the benefit of those trees. We don't really want to consume trees as a service.

Because trees as nature is a service if you like. So anyway, with that-- so that's another thing to throw in. Just to go through a classic economic analysis, if you think there are issues with the incentives, and I think there are, then you can go through three-- there are three different pathways you can take. One is subsidies. Another is regulation.

And a third as sort of a hybrid in some ways is nudges, which people-- which are less-- basically, leave people with their choices, but try and nudge them in various directions. Now, an example of this from the early days of Canberra was that if you got yourself-- and maybe it's elsewhere. The town planners around here can tell me.

If you've got that the owners of a new plot of land in Canberra-- I think they were obliged to build on it within five years or something. And they got 20 free seedlings, which is hardly very expensive for the government to provide them. But it gets the ball rolling if you'll pardon the mixture of metaphors. So there are lots of little things that could be done like that.

For all I know, we're doing that more today than we were then. But that's one example. There are also things that other people know more about than me. Schools could adopt trees in their local park. There are different ways we can try to bring into our lives trees and become a little more intentional about looking after them and the benefits that they generate.

Richard Manasseh

Well, thanks, Nicholas. So do we think we're training, people, Stewart, to not only appreciate the trees, an aesthetic element, but also to understand its role in the city and its benefits?

Stewart Detez

That's a really good question. It's two parts there. One, the appreciation for what the trees do, the value they provide to us. Their functional value is something that I think we as a society probably hold with a bit of contempt. They are there. We just take them for granted.

And we really don't take the responsibility to manage them appropriately. As far as training for the correct management of that, I think we're sort of at a point where as our environment is changing, as the demands on our living infrastructure has been increased. And the advent of technology.

We need to be relying on more science to make the decisions about, when do we remediate? What do we do? How do we prepare areas that are going to make sure that these trees are going to provide and function the way that they're designed to do? I think we've got a lot to learn. And it's that saying that the more we know, the less we know.

And it comes down to, we don't understand the complex nature of the internet of nature and how they're all interconnected. So there's a lot more learning that needs to be sort of probably put in at the grassroots, but also a lot of other organizations, or other areas, other disciplines need to understand that we're interfacing with nature.

And it's not to be just held with contempt. I know that we're having a lot more conversations with architectural engineers and their desire to actually understand the living nature of our green environment. And how do we work better for that? Now, we're getting there.

Richard Manasseh

Thanks, Stewart. Mark, I'd like to put you on the spot as an architect. With architectural software when they're doing a design and they're rendering a building in its environment, is it just simply a case of clicking the mouse and a tree pops into existence? Is any reckoning of the soil underneath, the drainage, or the benefits of the tree taken into account?

Mark Burry

The interesting-- trees were a big problem in early days of software. Because we just didn't have the computer power to model them. So if you look at architectural renderings from the 1990s, they're bereft. We would actually look to landscape architects for that kind of knowledge.

The interesting thing about architecture is that it just covers so many subjects from philosophy to science. But it makes us natural collaborators. So the last thing an architect ought to do is assume total knowledge on this subject.

How is that politically? We've got a lot to say about trees. We haven't actually mentioned their symbolic value and the fact that in the colonies, we have botanic gardens that have a lot of European species, so folk can be sort of transported home. And in the colonizing countries, we have all these botanic gardens full of exotic species showing off-- the conquest.

So then you get the situation with Melbourne being full of-- polluted with a whole lot of trees that are actually very good for certain functions like the plane tree. As I understand it, that's why they're popular in Europe. Pollen doesn't seem too good. But we hate them here, because of what their symbolic value represents, possibly. But they're safe trees in many ways.

And then our local trees-- I don't know if anybody's experienced being in the bush on a perfectly windless day and the sound of a limb falling off for no reason. But it seems like putting a tent up under a gum tree isn't such a good idea. And the last thing is I understand all our elm trees reached their sell-by date. I'm interested to know what's going to happen with that.

Richard Manasseh

So this is a good point to bring Matthew into the equation again. Just on this point, Matthew, European trees versus exotics in the city. What would you recommend?

Matthew Daniel

I would say that we need to look at functional value. And we need to determine functional value. So I'm not necessarily sort of all for natives or all for exotics. I'm all for a functional value like a micro-climate production, that a grove of trees or a single tree.

And I don't think we know that yet. We need to quantify that information. And that's the future. On the topic of landscape architecture, Sir Howard Olmsted-- he's sort of known as the father of landscape architecture. He was actually a naturalist.

And he went out into nature. And he would use-- he would find perfect scenarios where he would find a species of tree and then figure out which plants grew well around that. And so Central Park and a few other parks around New York there-- they designed-- they're man made.

But they're designed based on nature. And the whole idea was it was a functional value. And he was way before his time. And that Central Park wasn't designed as sort of an aesthetic place. He saw early on that a city like New York needed a green space for humans to go and calm down, basically.

Mark Burry

A pair of lungs.

Matthew Daniel

Yeah, a pair of lungs. Yeah.

Nicholas Gruen

They certainly need it in New York.

Matthew Daniel

Yes.

Nicholas Gruen

They need to calm down in New York.

Matthew Daniel

Yes, that's right.

Richard Manasseh

One thing I'm wondering-- this aspect of data. Could you tell us a bit about the data you've been collecting or seeking to collect from trees, Matthew?

Matthew Daniel

Well, to get to determine a functional value for trees and to manage trees holistically, I collect a huge amount of data. So I try to quantify soil health. So I measure soil microbiologies like bacteria, fungi, protozoa, nematodes. I measure all their chemistry, total available, exchangeable nutrients.

I measure the physical status. And then I measure photosynthesis. And the whole idea is to try and use this #nonsensedata, but good data to actually start to quantify tree health and look after trees, so that we don't end up in a situation where we have elm trees reaching a decline status where they have to be removed.

Now, this will be controversial. Elms live much more than a hundred years. The elm trees in this city are in a state of decline not necessarily because they've reached their use-by date. It's, how healthy is the below-ground aspect? How healthy is the tree? Have we quantified the tree?

This is how. We need to start really valuing nature. We're going to absolutely rely on it. A city full of sick trees-- look at some of the pictures on the screen here. Those trees are not providing micro-climate. I've just come back from Queensland. This is Brisbane. These are 20-year-old installations. That one there-- Waterhouseas.

And those round balls there-- they're micro-climate production thing. The whole idea of those is that they eject water vapor to produce a micro-climate. Now, the trees are supposed to be doing that. But when the below-ground components of the plant, which is essentially, from my perspective, the most important part of the plant.

The above-ground part is where a lot of stuff is happening. But the above-ground part is supported by the below-ground part. A healthy tree comes from a healthy root system. And a healthy root system comes from a healthy soil. I might pull it up.

Richard Manasseh

Yeah, I wanted to get Scott to take up on this point. If we can measure these quantities, can we measure them on the fly? And what can we do with them?

Scott Rayburg

Yeah, thanks. I think Matt's point is really important. The fact that we've been making decisions about trees based on what they look like or someone's just purely subjective judgment is not going to do anybody any good. And we can see this decline in trees is happening globally.

It's not just here. It's around the world. And it's largely to do with the time that urbanization set in. Most of these trees are reaching a hundred years old. That's about all they could handle in the poor conditions in which they were planted to begin with.

So better understanding is really important. I agree with Matthew that a lot of the below-ground things-- what's happening below ground is going to determine the health of the tree and the ongoing vitality of that tree. There are ways that we potentially can get a handle on that.

So one example is a company out of Armidale that makes a tree water sensor. I can put that on a tree. And we can watch in real time the amount of water that that tree is using. And the wonderful thing about a tree is that it is the ultimate transducer.

So whatever the tree is doing, however the tree is feeling, it will be reflected in that water use. And that means if something's going wrong below ground, you'll see that. If something's going wrong climatologically. You'll see that. If the tree has a disease, you'll see that.

You won't necessarily know why the tree has gone off, but you'll know that something's wrong. And that can trigger you to go out and take a closer look. I think that Matthew doesn't use this terminology, but I think of Matthew as kind of like a forensic pathologist for trees.

That's really what you need, someone to say trees are declining. It's not because they're a hundred years old. It's because something's not right. Because you only need to look at what these trees would do in nature to know that their life spans are usually in the neighbourhood of 200, 300, even 400 years.

That means all these trees that we planted that we're seeing decline around Melbourne-- and the London planes are another great example of trees that are declining around Melbourne. These trees should keep going. The London plane should live to be 300 in ideal conditions.

There are things that are going wrong. Part of that is poor quality soils. Part of that is just the way we've built in and around trees. We've encased them in concrete. Now, their root network is encased in concrete. How is air, and nutrients, and water supposed to get to that tree? How can they possibly survive?

We build a road. And we cut the roots out from the tree. What do you think is going to happen? If I cut your legs off, would you be fine? Probably not. So we treat trees with disrespect. They have no status at all. We can all agree on this, I think, in a planning context.

Nicholas Gruen

They don't vote.

Scott Rayburg

They don't vote. They have no status. So if I want to build a new piece of infrastructure, the first place any council or government will look is, where's the park? Where is the tree that I can cut down? The only thing I'm concerned about is that I might get a few citizens who will raise a stink about that.

But I'll just ignore them and knock the tree down. They're not recognized for their value as part of an urban infrastructure. Without trees, cities don't really exist. They are part of the infrastructure. Or I'll call them the green infrastructure to go with the grey and the blue.

And if you don't think about that, and preserve those trees, and plan for trees, then our cities are going to be very, very grim places to live. Imagine, again, a climate change future with urban heat on top of it. In Melbourne, for those of you who don't know, it only takes a temperature of 30 degrees in Melbourne to double the mortality rate in this city. 30 degrees.

Now, urban heat in Melbourne is adding 2 and 1/2 degrees to our temperature on average, up to 16 degrees is the largest recorded. So put some climate change on top of that. It's not going to take much for us to be seeing those 30 degree temperatures much more often.

That means people are going to be dying in Melbourne much, much more often than they have any right to. And if we were thinking about the importance of this green infrastructure, that sort of thing wouldn't happen. I think I've probably talked too much.

Richard Manasseh

We've got limited time. But I'd just like to ask Stewart again about education. I think what we're doing in Swinburne is starting to educate the younger generation who will be dealing with the trees about how to use this sort of data Matthew has talked about, the instrumentation we can now fit trees with. But there's probably a bit of a gap to the actual city managers. How do we get the message across?

Stewart Detez

Well, this helps. This type of venue certainly raises the awareness of the concerns that we do have. One of the focuses that we can-- is focus on future-ready graduates as opposed to students who are only equipped to deal with what we currently know.

So by raising the inquisitive nature of people to find solutions, by using technology, by using artificial Intelligence to actually analyse and diagnose the potential sort of improvements we can make, and skill them with that. So in a lot of our areas, we're looking more at the mindset of a technician as opposed to a worker, a technician that's actually tweaking, and managing, and sort of making sure that we're doing the right thing.

As this event was opened with acknowledgment to the traditional landowners, we have a right to support them in being custodians for this natural environment we've got as well. So we've got to create that mindset in our future generations, that it's a responsibility to look after that.

Once it's gone, it's gone. We talk about replacing a tree. And I think your first question was about, if a tree dies, big deal. Just plant another one. The cost, the time required to ensure that gets to a functional member of the tree community is something that we can't afford to continue to do. We need to. Need to do.

[INAUDIBLE]

Absolutely. And particularly when we sort of put them in an environment and we refer to them as tree coffins, when we put them in a hole in the ground and sort of prevent them from interacting in that world, that internet of nature, they're not going to survive.

They are sick, and they are dying. And you don't have to go too far to see that. So we've just got to-- as a university, we have a responsibility. As a community, we have a responsibility to actually lift that awareness and ensure that the respect and the contempt is removed from our current set of ideologies.

Nicholas Gruen

One of the things I was thinking of when Mark was talking about trees was that trees are one of the few things left which are, from a human point of view, multi-generational projects. So in architecture, we got rid of them when we got rid of the cathedrals, basically.

The cathedrals were the structure that you would watch being built, knowing you would never see it finished. And trees are like that. The trees we can see here-- I would imagine were planted before I was born. And certainly, the trees that I like the most started growing before I was born.

And so they remind us of something huge, which we've kind of given up on in the human world as we reinvent ourselves with each generation, as if we're not the product of 2,500 years of Western culture, starting with The Parthenon, my favourite building.

Stewart Detez

But I think we've really forgotten that, that they are here for a lot longer than us. Our decisions are made around our immediate need as opposed to what's already here and what needs to be here in the future.

Matthew Daniel

I would just urge everyone to stop every now and then and have a really good, hard look at your favourite tree. And have a think about the tree holistically from the below-ground aspect, the soil health. Have a think about all the things you can't see, like all the microorganisms. Have a think about how the tree is actually producing energy, its own food.

They're the only organism on the Earth that can produce their own food. And then have a think about what we're doing. Swinburne and all universities-- we absolutely have a responsibility to raise the bar. We are running out of time. Trees take decades to grow to be able to produce functional values. And we absolutely have to embrace complexities.

Nature is infinitely complex. It's full on Rumsfeld quote about known unknowns. The more that I'm learning, the more I realize how little I know and how complex nature is. And if we're going to use nature to help us survive and move forward in climate change, we have to start thinking outside the box.

And we just have to embrace the complexities. Nature is just so complex. And we really can't rely on reductionist science to do that. Because we're not going to be able to move forward based on the understanding that we have right now. So that's my little soap box.

Scott Rayburg

And I'd just like to end my say on, if anyone ever tells you that it's OK that we cut down these 30 mature trees because we planted 200, you can call them for bullshit. Thank you. Because it's simply not true. Again, those hundred-year-old trees are irreplaceable.

They will take a hundred years to replace. Those 200 trees-- most of them won't survive at all. And one 100-year-old tree probably would take something in the neighbourhood of 100 or 200 trees, just for the one tree to even begin to replace the value of that tree. And some functions of a 100-year-old tree cannot be replaced by any number of small trees.

So it's the big, mature trees. They are irreplaceable in our landscapes. We should be doing everything we can-- forensic pathology, spending whatever we can to keep these trees alive as long as we can. And at the same time, be planting the trees for our next generation to be looking after as well.

Richard Manasseh

Scott, I think-- do we have some questions or queries from the audience?

Audience Member

Hi, we've talked about below ground. But to sort of pull the cycle right around to when we were talking about transport and other things, it seems to me-- I live down St Kilda Road. And I have particulate matter in my apartment all the time, because I've got Queens Road, and St Kilda Road, and so on.

The trees must be incredibly dirty. I mean, I know we have some rain. But surely, in the conversations at a full-on complex policy, we could-- problem discussion. We should be, in fact, thinking about giving that a value, that you can only build or put out a road if you do X into the forest futures.

Matthew Daniel

You would assume that we'd know that. You would assume that we measure that. We don't. As an industry-- all my background is of horticulture. I'm quite happy to be controversial and say it's #nonsensedata. Me walking around and going, I reckon that tree is OK. I'll measure the diameter at breast height, then do a rough guess of where I think the root system is, guess the height, guess the width, and then probably, if I'm a good arborist, absolutely nail the genus and species.

None of that information is really telling me how well the tree is dealing with that particulate matter. How healthy is the root system? How much soil moisture does it have? Does it have all the microbial associations? Is the chemistry right? They're a natural living organism. They are complex. And we just don't measure those things.

Richard Manasseh

Well, let me give you kind of a science fiction scenario, which maybe isn't too far into the future. I've got a house. I've got a tree in my garden. I have sensors on the tree. The sensors are reporting the photosynthesizing of the tree. They are reporting the amount of water being drawn from the soil by the tree and therefore, the reduction in storm water drainage load on the soil. And therefore, providing a benefit to the urban environment. What I would like is that data to be [INAUDIBLE] somewhere. And so I can send a bill to Melbourne Water. Will they pay the bill, Nicholas?

Nicholas Gruen

Well, subject to it being low transactions costs, which is a big part of it, they should. But there are lots of these things. So we've got kind of an interface between the private-- your garden, your private life on your block, and the public sector.

And that interface involves taxes. You pay taxes. Now, at any point, I can say, well, I've done less. I've gone from five automatic washing cycles this week to three automatic washing cycles this week. Where's my rebate? So I'm not sure that we want to-- I mean, in principle, what you've said makes sense.

But I'm not sure that we want to turn the meter on every micro part of our lives. But the issue you've raised is an important one. And here's another thought, which is that the economists tell us that-- they're famous for knowing the price of everything and the value of nothing.

An economist's utopia is where everything transacts for only its value and nothing more and nothing less. But in fact, human life is made up. What's valuable about human life is actually made up of externalities. So I'm not charging you for the words I'm saying now.

Richard Manasseh

Just as well.

Nicholas Gruen

And it would pretty weird if I was. And so we wander around our lives making shared meaning and sharing value with people all the time. That's actually what human life is. So the way we have it now isn't imperfect. But the answer is not some economist's wet dream in which everything has its price, and everything is valued by its price. There's a whole-- human life is basically mostly unpriced, thank goodness.

Richard Manasseh

And at the moment, trees are unpriced as well.

Nicholas Gruen

And trees are suffering from that.

Richard Manasseh

That sounds right.

Nicholas Gruen

So we need to address that. Absolutely.

Richard Manasseh

Sorry. We're almost out of time. I'd just like to pass the microphone around one more time for a passing last comment on what we think the future of the tree is in the city. Matthew?

Matthew Daniel

I'd say it's absolutely essential. I think the living infrastructure in the city is the most important infrastructure. It's like the saying about you can't replace a human life. You can build a new house when you go through bush fires and things like that.

The green living infrastructure is really the most important infrastructure. It's probably a bit controversial with architects. And I know old buildings and things like that have value. But I just want to see more value in trees and living infrastructure.

Scott Rayburg

Oh, I think the future right now is not great, mostly because we know so little about trees in cities. We just had a little experiment this year where some of my students who work in a city council went out. And we had some trees that were planted eight years ago in what's considered the best practice urban planting configuration.

And we excavated the roots of those trees. We left them intact, but we excavated the trees to see where the root networks had gone. And concrete all around, a small, little open air pit. The roots hadn't extended anywhere beyond the edge of the concrete.

The trees were so weak that they could be physically pushed over by hand. These are eight-year-old trees and physically pushed over by hand. There is no possible way those trees will ever reach even 20 years old, let alone the 40, 50, 100 that we need.

That's what's being planted right now all across Melbourne. So our future big canopy trees-- they are not existing right now. And if we don't get this right and get it right fast, then your children, your grandchildren are not going to have mature trees anywhere, except maybe in parks. So there's a lot of work to be done.

Matthew Daniel

Can I say one more little thing? I helped out with that project. And the only area where the trees actually grew roots was where we detected microorganisms. So life was only growing where there was life. Now, next time you have a look-- when you're on your way home today, have a look at the soil where your favourite tree is. And have a think about how much life there is. Can you see any life? Most of the time, you won't be able to.

Richard Manasseh

Stewart, last comment?

Stewart Detez

I think it's fantastic that we're sitting in the middle of this park at the moment. Because it's sort of-- it's very important to see that over here, we've got kids that are interacting in the green organism or that green space that we've got. We like being here. I know that it's where I feel more empowered. Could you imagine if it wasn't here? Go away thinking about that.

Mark Burry

Yeah, go to Singapore. I mean, don't go to live there. Just go and see what they're doing there.

Richard Manasseh

Yeah, so we're right out of time. So I'd like to thank our panel very much. And I hope we all go away empowered to think about what we can do with trees in the city in the future. Thank you.

[APPLAUSE]