

Urban Heat Island Webcast January 29, 2008

Introduction

Eva Wong:
Slide 1

Logistics. Please mute phone line by pushing *6. To unmute *7. For full screen view push F5. We are going to try to use feedback to presenter function. Changing color to purple means you have a question. Presenter will decide when to field questions. The attendee list allows you to see who else is on the call. Those are the main features. I hear some background noise. Please put phones on mute. Now unlocking control of content and handing presentation over to Steve.

Presentations

Eva Wong:
Steve Moddemeyer is the Senior Strategic Advisor with the Seattle dept. of planning and development. Steve is going to provide an overview of Seattle's new landscape requirement for their commercial areas. One other thing to note is that this webcast is being recorded and the PowerPoints will be posted afterwards.

So, Steve go ahead, thank you.

Steve Moddemeyer:

Thanks, I hope everyone can hear me OK. What I'm going to do is talk about Seattle's green factor, which is a landscape ordinance that was adopted in the commercial areas of the city. I'll briefly talk about where it came from and how it's been going since we adopted it, which was about a year ago this month.

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The history of the green factor is that, as I understand it, in Berlin, about 10 or so years ago they were looking at watershed planning and trying to figure out a way to recognize the role that urban areas play in watershed function. And so the green factor was developed by a fellow named Carlo Becker, who the city of Berlin has adopted which basically said that if you have new development or redevelopment of a certain size, then it has to replace some of the missing ecological functions through the use of landscape.

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Let me just briefly explain why, which is the second slide here. It's probably true everywhere on the planet but certainly in the Pacific Northwest where we are. We were, at least in our habitat, covered with forests, and then of course we removed all that forest,

and the idea is, can we recreate some of that? There are a couple big reasons for that. And one is that, by removing all of that forest, we removed a huge amount of surface area that used to intercept rain.

Interruption, please mute phone lines.

The point was that by removing vegetation we removed a lot of the surface area that used to be in our native landscape. And that surface area was intercepting a lot of rain. And also the plants themselves evaporated a lot because that's how they operate. You know, they evaporate into the air and that's how they pull in nutrients. And, what's happened in Seattle and probably elsewhere is that literally the amount of runoff that we get has exploded tremendously. And this runoff, or storm water runoff, drives all of our costs for all of our sewer improvements, all of our storm water improvements, and all of our natural area restoration activities are almost all dealing with this enhanced amount of runoff. So we're looking at something like more than 30% increase in the actual water we deal with because it used to evaporate back into the air or it used to be absorbed into the ground and then evaporate through the plants.

So, one of the ideas that we're looking at is can we increase the surface area and the green activities and storm water runoff and integrate it with our most dense urban areas.

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I'm sure most of the folks on this call know that landscapes and vegetation provides a huge array of benefits. And, in Seattle, up until the green factor we basically thought of landscape as an aesthetic amenity or something to screen out parking, and we would often waive it in particularly dense urban areas like commercial areas. But, now that we look at this list of benefits that come from vegetation – you know absorbs carbon, releases oxygen, helps capture dust, muffle sound, it's habitat, property values increase, people love it, they're actually willing to pay more, it helps buffer the high summer heats by providing shade, and also the active evaporation provides cooling, and so it has an urban heat island effect. It also helps buffer buildings so that they're buffered from both the highs and the lows of summer and winter temperatures. And if you use green roofs or vegetated walls, that can also increase the life of those membranes or building claddings by limiting UV access and expansion and contraction due to heat and freezing temperatures. So, there's a bunch of cool things plants do, so we're saying that plants aren't just an aesthetic amenity, they're part of the environmental function of the city and we want to return them, even in dense urban areas.

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One of the ways we do that is really recognizing a bunch of things about it. One thing we did is we took the German system which is identifying landscape strategies then multiply them—give them a factor that you multiply by. One of the things we heard from our folks was that they really valued the landscaping that's done on the street itself. So, when we set up the system we allowed the property owners to count any sort of improvements

they do in the public right away toward meeting their landscape score. The idea being it would be more visible, and also it wouldn't just benefit the building residents but benefit the whole community. So things like visibility help count, as well as lots of alternative versions of what vertical vegetation is, which we're going to hear more about. It provides a lot of the same benefits that a green roof provides, so we really upped the score to encourage people to do that, and it has become one of the most popular ways that people make up their green factor score, because it takes up the smallest amount of footprint of the parcel but provides a lot of green in a narrow footprint so it's been popular as a technique. So, of course we're encouraging it to clime, hang down, and even be on trellises.

Slide 5

The way that it works is that you figure out how much of the landscape is dedicated to various uses. And I know it's hard to see this, but basically if you've got a lawn area we'll give you credit for 2/10ths of a foot, but if you've got vertical green or green roofs then you get the highest score per sq. foot dedicated to those uses.

And one of the key things we've done is encouraged layering of plants, because that's the way that our native systems exist. So, if you have soil that's deep, that counts. If you have a shrub layer that also counts. If you have a tree canopy above that, that also counts. You can start counting multiple scores for the same sq. foot if you've got the layering going on.

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So, this is probably a little hard to see. At least it is on my computer. But this is an electronic worksheet. It's basically an Excel spreadsheet that's locked. It's an iterative tool that the designer uses to determine the score of their project. So, they down this sheet from us, then in that top left box they put in the sq. footage of their parcel. And as they're doing their landscape designs they fill in these other boxes. This sheet will automatically give you your score – how you're doing on meeting your green factor. So, this is an Excel spreadsheet, and in a way it becomes a game because you look at your project, then you design it, then you add up the numbers, and then you say, "Oh my gosh, I don't even have the target." And in the commercial areas it's .300, which means roughly 30% of your parcel covered with vegetation. It's not exactly that, but that's kind of roughly what it means. What we found is, and actually one of the engineers in town did a lot of this work...he applied the German biotope area factor, which if you Google you can find the English version on the Berlin website on that biotope area factor...but anyway, he applied that to some of the LEED buildings in Seattle, some of our green buildings. And they were coming in with a score of something like, .15 –15% to 17%. Some of them even less than that. And so, even our green buildings were not even half way there for what we want all buildings in commercial areas to meet. And this is a requirement so they must meet it. But, the way that they meet it is that they go back through and they look for areas that can put vertical greening, which is typically not used.

A lot of people are choosing putting in green roofs. And a lot of people are putting in permeable paving because we also allow credit for paving that infiltrates into the ground.

Slide 7

When you're in the Excel worksheet, which is on the Seattle.gov/dpd/greenfactor (which is the Seattle Department of Planning and Development)—when you go that worksheet, if you hold the cursor over the boxes a little definition window pops up and tells you exactly what the definition is for this that fit in it. It's interactive in that way.

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Once the designers are done they submit not only the worksheet but they also submit this other sheet which basically identifies each planting area and how the score is being added up. And so our plan reviewers have appreciated that this is fairly easy to review. So they look at the landscape design, and they look at these call-out boxes, and then they compare them on this sheet to see if they really add up to the score that the worksheet predicts. And so they can do a little ground truthing and go, "can you really get two trees in that little spot." Or, if you said 22 trees in that little spot on this particular sketch, they'd go, "Wait a minute, I don't think so." But it's fairly easy to apply. However, if you're the designer there's a learning curve and the first time through a lot of people get pretty frustrated because they know how to do design, and they know how to fill out all the other forms we have, but this is a whole new thing. However, the learning curve is fairly quick, and once people get over it, people get very adept at, in a way, gaming the system—the idea is not to beat it, but how can I meet my clients' needs, and the city's needs for the score, and what's the most cost effective or most exiting way that we can meet the green factor score. So, there's a lot of creativity going into different solutions with every project.

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So, this a project that has the kinds of things that we're looking for. On the right hand side you'll see the layering of the vegetation and the ground cover and the tree canopy. We'll give credit for...on the left you'll see a wall with a some vertical greening, and then some more layering. Ideally, inside there'd be permeable paving and things like that and potentially green roofs and things like that added to the project.

Slide 10

So, I've kind of raced through it, but what we're trying to accomplish is to maximize the vegetation potential of these parcels and the right-of-ways. We're trying to reward layering of plant material. We also give credit if you're using drought-tolerant plants, and or rain water harvesting to water those plants. If you have existing trees that you have to preserve or that you want to preserve those count. And we encourage you to plant larger species of trees because that maximizes the canopy cover and the benefits.

We give credit for visibility, meaning anything visible from the right of way gets a little bonus point. And then we let the developers kind of pick their own way to go. There've been some developers who've said, "I hate green roofs, I don't ever want a green roof." And we said, "fine, then, do it without a green roof." But other people, you know, go right to green roofs. But, as I said, what we're seeing is a lot more green roofs, a lot more vertical vegetation, and a lot more permeable paving. And then just a general increase in the thoughtfulness on landscaping. Maybe I should open it up for questions?

Dimitri, Sarasota Cty:

I've been on your website before, it's a great program. Is there a diversity of credits that the applicant can take, or is it one standard form of credit?

Steve Moddemeyer:

What do you mean?

Dimitri, Sarasota Cty:

Well, would they be able to get impact fee reductions, or something of that nature?

Steve Moddemeyer:

No, we ended up just making a requirement. You either meet the green factor score, or you don't get to build your project.

Dimitri, Sarasota Cty:

Then I'd move to where you live.

Steve Moddemeyer:

Right, and it's really inspired a lot of people to meet the score.

Caller:

I imagine it would!

Cathy Deal, EPA R9:

What about the use of native species over exotics?

Steve Moddemeyer:

Well, often natives are in the drought tolerant list but we're not particularly calling out natives because it's such an eclectic urban landscape that we're kind of giving up on that. It's certainly allowable if the developers want to do it, but it's not one of the ways that you jack up your score, unless it's part of your drought tolerant species list.

Jeff King, D.C.:

How does this relate to the green area ratio that I've heard about? Is it basically the same thing, or...?

Steve Moddemeyer:

Yes. We actually started off calling it the green area ratio. “GAR,” because we’re government officials and we like to put in acronyms. And that didn’t inspire us too much. And then we called it the Green Area Factor like they do in Malmo, Sweden. And that was “GAF”. And our director said, “You’re not going to call this ‘GAF’.” So, we ended up calling it the Seattle Green Factor. But it’s a child of the same progeny.

Jared, Alliance for Community Trees:

Do you know of any kind of ordinance or laws using this?

Steve Moddemeyer:

Well, it’s an ordinance here in Seattle, and it’s the only one that I know of in the states. But, we are also expanding it. At least we’re attempting to into the multi-family zones of the city, which will greatly increase the amount of the city that’s covered by this. So, as we go through the zoning of our city, we’re adding this in to expand its adoption. And those are all in ordinance and part of the law but I don’t know of anyone beyond Seattle, at least so far.

Jared, Alliance for Community Trees:

Where can I go to get a copy of that?

Steve Moddemeyer:

It’s on the website that I mentioned – seattle.gov/dpd/greenfactor.

Dimitra:

How does this tie into a fairly recent ordinance that was enacted requiring builders and developers to calculate the GHG emissions of structures that they’re going to build?

Steve Moddemeyer:

We haven’t quite gotten there on the GHG issue, but what we are doing is evaluating how we would calculate the GHG impacts of various development proposals or zoning strategies, and then we’re going to start regulating within the next year or so to find a way to deal with this. Since GHGs are now a pollutant, they fall under our normal pollution laws, and so we feel like we need to start when we’re doing CEPA or NEPA (or whatever it’s called where you live) – our environmental evaluations are going to have to start including that. The green factor isn’t explicitly a carbon strategy. I think it heads in the right direction, but it’s not nearly what you would need if you were really going after carbon. So I think there’s other work ahead of us.

Cathy, EPA R9:

CA has been working on a CEPA guidance document related to that. And I could probably give you a contact, if you’d like. The name doesn’t come to mind at the moment.

Steve Moddemeyer:

We have been looking at CA, but this is just an emerging and extremely important work for all of us.

Ash, CARB:

One of the things that has occurred to us that we're thinking of doing is this idea of climate baselines, or if you like, GHG baselines. You know, just figuring out what's the GHG signature of whatever building you happen to be in. This idea goes part in parcel into those fancy little things called climate calculators. We've all seen multitudes of these things, haven't you? So, my question is, is there any thought in Seattle or elsewhere for coming up with ways of coming up with some kind of a climate signature – just reporting the baseline GHG signature of buildings?

Steve Moddemeyer:

It's still being worked on, and it's still very early, so I would say the answer is no. I'm not saying no because we don't think it's a good idea. I just don't think we've evolved that far yet. But we are looking at a whole bundle of activities that go from how we use conservation, how we look at alternative sources of energy generation—thermal and electric, how we look at zoning and the impacts of the way that people arrive at the buildings as well as the embodied energy of the buildings. So we kind of have it parsed out in a bunch of different ways which are all supportive of the concept but I don't think they're quite rolled up the way you're suggesting.

Ash, CARB:

OK. There's another question that comes to mind. You know that green roofs or white roofs are kind of in something of a competition. So, the question is, if somebody doesn't want to do a green roof but is willing to do a standard roof using cool roof materials, does he get to do that?

Steve Moddemeyer:

Well they can definitely do it. We wouldn't give them any score for meeting their landscaping requirement. But, we would if they were doing a vegetated roof. We also give credit towards meeting your drainage score. You have to meet certain drainage requirements for new buildings, and so, if you're using things that control runoff, like permeable paving or vegetated roof, then those can count towards meeting your requirement that the utility calculates. The cool roof is a good thing, but it's not part of our landscape score.

Ash, CARB:

OK. And, in your tree requirements, do you have a standard select tree type...assessment of tree species that you recommend so that monoterpene and isoprene emitting species are not inadvertently planted?

Steve Moddemeyer:

I was going to say yes until you got to those last two points, which I don't know and answer to. But we do have a list of street trees that approved of various sizes, by species at full growth. The larger the species the higher your score. And then we let the landscape architects or the designers, if they're not in the street right-of-way, they can

select...kind of pick from the list or do an equivalent tree. But I don't think we've used that last criteria—the “iso-something?”

Caller:

You haven't been using biogenic VOC emissions as one of the criteria?

Steve Moddemeyer:

I guess not; I don't know anything about it.

Dimitra, Sarasota Cty:

Correct me if I'm wrong, but I know that there's a website—Select Tree—but that seems to indicate there's an accepted institutionalized standard only for the state of California. Outside of that state the impact of the BVOCs hasn't been kind of universally agreed upon because of climate, wind, other factors.

Ash, CARB:

Actually the emission factors are fairly universal. And, although the SelectTree database is not complete because we haven't yet come up with a tourpine emissions database, but for isoprenes, and isoprenes are critical for generating O₃.

Dimitra, Sarasota Cty:

Yeah, I was just doing a lot of research recently on SIP plants and perhaps the integration and there was a lot of discussion on both sides actually.

Ash, CARB:

Yeah, for most of these...the data that comes for SelectTree is from Benjamin et al. And the databases that have been established are kind of standard. Even NCAR has adopted things like that. NCAR stands for National Center for Atmospheric Research.

Caller:

You are right, however, that the extent to which VOC emissions lead to O₃ concentrations would very much need to be modeled and would depend on meteorology and local conditions. So, you're right that in different areas they'll have different effects.

Ash, CARB:

Oh certainly. In Atlanta, planting a red oak will have a far more significant impact than planting a red oak in Seattle.

Steve Moddemeyer:

That's really interesting news to me, and I'll definitely follow up on this. SelectTree is the name of the website?

David Hitchcock:

I don't know that SIP modeling accounts for actually tree loss that happens in urban areas, which is probably more common than net gains and concern about what species of tree to plant.

Ash, CARB:

That too is an important issue. In fact there are efforts at Sacramento Metro Air Quality Management District and SMOD and others to talk about tree planting as a means of obtaining SIP credits. Although, this ideology has been tested in LA, it has not entirely been accepted in favor either by us or by EPA R9. But it's an idea.

Eva:

This is Eva. I have two questions and one is, Steve, can you give us a sense of how many buildings to date have actually met the requirements? And, how many you're projecting per year? You know, I'm trying to get a sense of implementation. Then, my other question is, what's the biggest obstacle? Do developers say 'this is just going to be too costly and we're not going to do it'? I'm just trying to get an idea of obstacles.

Steve Moddemeyer:

There's somewhere under a hundred buildings that were built in the last year in Seattle, and they haven't all been built because it just went into effect January 20th of 2007. And, that's very early in the Master Use Permitting Phase so a lot of the buildings are just getting constructed now. So, there's less than one hundred. Probably about the same this year...our local economy is pretty strong, but if it tanks that would lower. If we expand, which I'm hopeful we will into multi-family, that'll multiply it by a factor of 5 or 6, I would think. There'll be, I don't know, maybe 300-600 buildings per year within a year or two. But we're still just now starting to...we have a couple of grad students who are going to audit the first batch of buildings and see, you know, are they really building what they said they would? How's it look so far? Then we're going to try and do that annually to see how they perform. And there are lots of factors for why performance could be negated. They could maintain it in a way that removes the layering or they could tear out the plants, or there's lots of things that...[interruption]. On the obstacles, I would say that there has been resistance from the development community and in part, one of the ways we're doing it is that we're introducing the green factor as we go through and basically up-zone some of these areas, so we're creating higher density and removing parking restrictions to encourage transit use, and those are both very valuable to the development community. And we're saying, the one thing we want back is enhanced vegetation. So, they might save \$1 Million on parking on a building, and we might want \$100K back for planting, and they kind of forget the \$1 Million and remember the \$100K. So we're constantly trying to put it in that context of, "it's a package deal." So, the costs are roughly from 2/10ths to 1% of total building cost.

Eva:

Thank you. Maybe one more question and then maybe we should move on to Anton.

Mark Johnson, Futurity, Chicago:

I'm wondering if you can elaborate on this last slide where it talks about rewards and if that's calculated on top of the green factor, or how that works.

Steve Moddemeyer:

There are categories where you put in your actual amount and then there's some sq footage—for instance if it's visible—any of the sq footage that you get credit for, like on this sketch here that shows the little red car and the tree and the little trees to the right—you've already got green factor credit for those, and all of those get 10% added on top if they're visible from the public right-of-way. There's a couple of these and the other one is drought tolerance of plants and then also rainwater harvesting where they can apply to much of the area, so they're considered like a bonus on top. Because it's not a requirement, it just makes it easier to get to your score if you achieve these bonuses.

Mark Johnson, Futurity, Chicago:
Ok, great. Thank you.

Eva:
Thanks, Steve. Thanks a lot. Everyone, again, PowerPoints will be posted on our website, and this has been recorded, so if someone missed it they can see it again, or hear it again. Thanks again, Steve.

Steve Moddemeyer:
Oh, you're welcome.

Eva:
Now we're going to move on to Houston's Vertical Gardens Grant program, and Anton, if you want to take over the PowerPoint.

Anton:
Ok.

Eva:
Anton is the Planning and Urban Design Coordinator for Central Houston Incorporated, and he is going to present on the Houston Downtown Management Districts Vertical Gardens Grant Program. Everyone, please, phones on mute. Thank you.

Anton;

Slide 1

Ok, thanks a lot. I go ahead and start. The Vertical Gardens Grant Initiative (VGGI) was started by myself, and Patricka Daniel, the Director of Community Development for the Downtown District in the years 2006 and 2007. So, we're going into the second year of this now, and, the Initiative is the outcome of thinking of ways to mitigate some of the negative aspects that exist within downtown.

Slide 2

While downtown Houston has a collection of really great architecture, there is also this in many areas—inactive, blank facades that at times create inhospitable pedestrian environments that can really detract from the overall vibrancy of downtown.

Slide 3

In addition to that, many parking structures in the downtown can create the same undesirable effect.

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So, in taking the whole environment into consideration, the facades, good or bad, really affect their surroundings—whether they are small portions of the block or an entire block.

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And in Houston's hot and humid climate, which is at times very inhospitable to humans, is actually ideal for supporting a variety of very attractive plant life. Consulting the USDA plant hardiness zone map, as well as precedent local projects, we found the strongest climbing plants to be fig ivy, Carolina Jessamine, star jasmine, evergreen wisteria, mermaid rose. Houston is in Zone 9a, which is listed as average minimum temperature of 25-20 degrees, but it still very rarely gets that cold here, which essentially means that things grow well year-round.

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So, with these concerns and opportunities in mind, along with the fact that both myself and Patrick come from backgrounds in architecture, we found this quote by Frank Lloyd Wright, we thought quite fitting: "A doctor can bury his mistakes but an architect can only advise his clients to plant vines."

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All in all we wanted to make some negative situations into something positive and unique—something that the ecology of Houston would lend itself to, something that all of the stakeholders of downtown would definitely benefit from.

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And that money in the budget was allocated to a vertical gardens grant. And we set out trying to convince property owners and managers of the merits of this initiative.

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So, different strategies of vertical planting exist. In this case, direct growth is simply planting a climbing species at the base of a structure and allowing it to grow up it.

Property owners we're finding are seldom comfortable with this for fear of long-term damage to the façade due to root penetration.

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Also a structured trellis or panel system—this green screen is a prefabricated system that exists on the market. They are essentially rigid panels that are fixed to the existing structure and plant material grows within them and they're installed similarly to a curtain wall installation. And these obviously have structural concerns at greater heights, and there's a greater expense because of the prefabricated material.

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Another system is a cable system where plants grow on tensioned stainless steel cables. Well, usually stainless steel that are attached to the building structure. A big benefit of these is they usually create a very attractive design even before the plant growth takes shape, and some manufacturers of these are Hang Lines, and Carl Stahl is a different cable line.

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Another is potted and irrigated structures where these actually affixed to the wall and soil sits in the pots—this allows you to achieve planting at additional heights. The larger photo there is the Portland airport. That was a while ago when I was there. I assume that's grown in by now quite beautifully, and I assume it's pretty new. That was about a year ago. And, that's a prefabricated system that's done by eltlivingwalls (www.eltlivingwalls.com). And the great thing about this is that a climbing species of plant is not necessary for it. So, you can really get some nice variation of color and different textures of plants in these kinds of situations.

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Continuing, these potted, irrigated structures can range anywhere from very simple—where you might have the lower center image where it's literally a cage structure with numerous pots in it—to something very complex like on the upper center where the wall is actually impregnated with some soil material. This is actually a construction wall around a construction site where buildings are being built to create a nice spectacle rather than having a plywood wall around the surface. And to the right of that image, the right-top is actually a sound barrier wall on the side of the highway. So, these applications vary quite a bit and can really do a lot to improve an environment.

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Where I find these things to get a little more exciting is where you start to blur the distinction between the supposedly natural ecology and what the built-environment is. Here are some pretty interesting examples of that by a local landscape architecture firm (www.asakurarobinson.com), where they've used these gabion walls which are actually

rubble stones that are formed into large cubes, which are in a steel structure. And, like I said before, there's very little separation between what the structure is and what the planting medium is. And, again, because they're directly planted in the wall, and in some cases they don't actually irrigate these, you don't have to be dependent on using a climbing species of plants, so you can get a lot of variation.

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Here's where I think things get really interesting. I think it's some of the most involved and elegant work being done in vertical gardens right now. I include this as somewhat of a joke, but this seriously is part of this guy's work. It's a French botanist in vertical garden creator named Patrick Blanc.

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He's done some very incredible work, and this image is actually a collaboration with the French architect Jean Nouvel of the Musée du Quai Branly. It's a museum in Paris. This comes from him working with the knowledge that soil is not necessarily needed for plant growth, only constant water actually is. So these projects actually allow the plant to take root in an irrigated layer of felt that's attached to a steel structure with a PVC moisture barrier actually protecting the building.

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Again, a climbing species isn't necessary for these and it allows for a wonderful variety of plants. As well, from the context of a heat island, you could imagine that these buildings have very little, if any, heat gain. And, the evapotranspiration from all of the plants would have a cooling effect on the immediate proximity to them.

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For more technical information on this, actually on Steve's website, the Seattle site, there's a presentation by Randy Sharp, which is actually an excellent, in-depth technical overview of all of these aspects that I'm talking about. Obviously, when we show these images to property owners trying to get them interested in vertical gardens, they're always very excited by these images until they think about this one in the center with a guy maintaining these because projects like these would be quite a bit of maintenance involved with them. They're quite incredible.

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Moving on to our actual grant application, the Downtown Management District (HDMD) VGGI is intended to assist in the facilitation of wall cover plantings and exceptional landscaping on blank walls, parking garages, and sidewalks in Downtown; the intent is to improve overall aesthetics, pedestrian comfort, air quality and reducing heat island effect from keeping the sun from beating on these concrete and stone buildings.

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The grant is available to property owners, tenants, and registered non-profit organizations.

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New grants can exceed 50% of the total project cost. We can match the grant up to 20 thousand dollars. The match may include in-kind contributions such as professional services, materials, and/or labor costs.

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The timeline is with the optimal growing season beginning in mid-February and ending in mid-October, and the optimal planting season, which is actually a dormant season for plants is from mid-October to mid-February. We ask that applications be submitted before the end of the growing season to take advantage of the optimal planting season.

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Here are some of the projects that we have coming up from the 2007 grant applications. Here is a grant recipient in down-town Houston. The central parking garage serving the downtown office market.

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And, what they have proposed is a series of green screen panels, as well as super-graphic image sizes for all sides of the façade.

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This project will actually be executed in phases, so thus it may be eligible for subsequent funding, as the grant was conceived to be used on a per-façade basis.

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Here's one of the other facades of it.

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And another one that we have this year is another project in downtown. And it's actually the sidewalk façade of an office tower. This is not a vertical garden but we've expanded the grant application to include exceptional landscaping—anything that would add more evapotranspiration to the street, add more shade, etc. So, these building owners have proposed exceptional landscape plans with street trees and some pretty lush sidewalk plantings.

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Now, this is not a project that we funded, however, as it was constructed before our grant application was in place, but this is something we would consider a pretty exemplary project. This is the Christ Church Cathedral outreach center that was designed by Page Southerland Page. And you can see we have hanging planters and a trellis structure over a parking garage, and a planted arcade overhead trellis at the sidewalk edge. Now, this has all been planted with star jasmine, which will, probably within the next growing season, be covering the arcade area along the sidewalk, as well as that trellis façade over the parking garage.

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In addition to those green wall initiatives that we have going, we're also looking at various public right-of-way proposals.

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This specific one is looking at adding dedicated on-street parking, street trees, planting the street trees in-between the parking spaces, and utilizing structural soil in the planting areas along with permeable paving to allow percolation to increase water to the roots of the trees and add additional cooling to the streets by shading,

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And obviously creating a much better pedestrian environment, which we intend to do with this image.

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All of this is under the umbrella of the Heat Island Task Force, which is actually a larger initiative that was started by central Houston quite recently in downtown—being the Central Houston Environmental Stewardship Initiative. This includes obviously the Heat Island Task Force, the Energy Task Force, the Energy Task Force (basically energy use and trying to reduce it), Vehicle Miles Traveled per the amount of car trips, Vehicle Miles Traveled focusing on Bicycle trips, Recycling Task Force, as well as Education/Marketing.

Slide 34

And, that's all I have for you today, so I guess I can answer some questions if there are any.

Ash, CARB:

Hi, this is Ash again. I have a basic question which seems to have just occurred to me. Both for you and for the other ones in Seattle, my question is, did you before the projects begin have somebody go and do some infrared heat measurements of what these

structures heat signature is and then take such a measurement after the project is completed to see what the difference may be?

Anton:

That's something we're actually looking at doing. Now, all of these proposed projects have not gone into construction yet, so we actually still have time to do that. And, doing basically a baseline heat index of downtown is something that's basically on the to-do list for the Heat Island Task Force.

Ash, CARB:

Thank you.

Darlene, Philadelphia:

I have a question about one of the images you had with those rocks and rubble—I don't know where it was located, but, you know growth taking hold through those rocks. Can that be also used as a kind of damming strategy?

Anton:

These gabion walls are used quite frequently in landscape architecture, and you see them quite a bit lining rivers to fortify river banks and things of that nature.

Darlene, Philadelphia:

Ok, right.

Anton:

And the great aspect of them is that they actually will turn into structural soil as the smaller particulate settles in-between the larger rocks, and eventually the metal cages around them do deteriorate. And this will become a natural structural wall.

Darlene, Philadelphia:

So it actually becomes sort of imbedded. So, part of the wall stays exposed and the other part becomes sort of earth material.

Anton:

Yeah, this could feasibly fill in with vegetation and subsequently with dirt as successive freeze and thaw causes decomposition, etc.

Darlene, Philadelphia:

I have another question just in terms of the vertical walls in your grant program. Do you have incentives for those who are interested in doing green vertical walls on buildings that are occupied, as opposed to, let's say, parking garages, so you have the added reduction of A/C.

Anton:

This grant is applicable to any existing building where the façade could use some sort of improvement. Obviously we have some buildings downtown with, you know some

incredible architectural facades that we would definitely not advocate growing a green screen over. But for the most part, this is open to any property owner that seems fit to apply for it.

Darlene, Philadelphia:
Ok, thank you.

Barry, San Jose:
Is fire ever a concern, or something you've thought about? I mean it seems like most of these are irrigated, but with natural vegetation, or un-irrigated examples?

Anton:
Actually, that's not something that's ever been a question. However, it's a very good point. That's definitely something worth addressing.

Barry, San Jose:
I understand that ASTM is working on some standards relating to green roofs and that would be one thing of consideration, but it would probably be very different to look at that in terms of green walls.

Anton:
Of course.

Eva:
I have two questions. I'm sorry if you've already said this but, how many applications have you received to date, and how many are you thinking that you'll actually grant? And, are you thinking this is going to continue, this program? You don't see an end-date for this yet?

Anton:
Oh no, we definitely don't see an end-date for it in the soon future. The 2007 Grant, while the two projects I've shown you were two of the applications received and we subsequently gave the grant to, we actually have a couple of more that are coming in that are requesting 2007 funds, and we do still have the funds to grant those. However, what we've found is, the word essentially got out a little bit late in the 2007 year for property owners to move on this initiative. However, in 2008, we've gotten a considerable amount more interest simply because property managers and property owners already new about the grant and were able to build it into their 2008 budgets some exterior improvements to where they could match our grant portion. So, we're expecting quite a bit more for the 2008 season.

Eva:
One other question. Sorry to hog this, but, what about enforcement? Someone submits a proposal that they're going to do this, you give them the grant, what kind of enforcement do you have to make sure they follow through?

Anton:

Well, that is essentially that after the project is done, the funds would be dispersed.

Eva:

Ok, that clarifies it. Thank you.

Anton:

Any other questions?

Eva:

I think we have a couple of questions in the queue. Is Irene on the phone? Not to put you on the spot.

Irene:

Where does the funding source come from? And, how do you determine who gets selected, and what is the criteria for the grant award?

Anton:

Ok, I heard that your question was, what was the criteria for selection, and where do the funds come from?

Irene:

Correct.

Anton:

Ok the funds come from the HDMD operations budget. That essentially comes out of funds that are done by an incremental tax assessment of all of the downtown property owners. So, that's why we tried to craft this so it would be of mutual benefit to all of the stakeholders of downtown. As far as the selection criteria, that totally depends on the amount of applications that come in, and through the review process, how we feel any of the given applications would best impact the overall environment.

Irene:

So then are the downtown folks actually part of the selection committee?

Anton:

No, that's actually done by the management district staff.

Irene:

Thanks.

Irene:

You had mentioned that Randy Sharp gave a presentation about the wall?

Anton:

This was just something that Steve had suggested I look at that is actually on the Seattle website. And it's a pretty comprehensive overview of the more technical aspects of the kinds of things that I've shown you in this slideshow.

If you have further interest in more of the technical portion, I would recommend looking at it, definitely.

Cathy, R9:

One of the concerns that we have here in the Bay Area is that we have a lot of hills, so all of the runoff goes down into the Bay. And because of the exotic plants, we have a really high load of nutrients and pesticides ending up in the Bay. And I'm wondering if either of the Seattle or Houston projects have looked at that factor.

Anton:

I can tell you, yes, definitely. That is a concern for Houston. Not so much in terms of fertilizers for the plants, but just basically the city runoff and what not, which is another reason why more of the living wall structure portions, rather than the vines growing on trellises are what we're very interested in because these things actually do filter water as it runs off of the buildings, and it has a very beneficial effect in that context, as well as other things we're doing with permeable pavings and things of that nature in some of the right-of-way improvements that we're trying to do.

Steve Moddemeyer, Seattle:

This is Steve in Seattle, and I have the same basic answer. Yeah, all of those things that keep water on-site help with the problem of mobilizing pollutants to larger bodies of water.

Eva:

Anton, there's a question here from Shana in the queue. Shana, I don't know if you want to un-mute your phone and ask, or...

Shana:

No, that's fine. I was just wonder to the extent that you were talking about planting trees in areas where you're parking, that generally tends to eliminate some parking, so I was wondering if you're coordinating with public transportation agencies.

Anton:

Yes, we definitely are. And the way that is really working is, for instance, situations like this image where we're proposing to put street trees in-between parking. That will essentially eliminate one parking space per block face. However, by doing this, we're actually creating a dedicated lane of parking, whereas now it's a kind of schizophrenic situation where it's only rush-hour parking. So, even though it's one less parking space, the revenue would be increased. So, we're not finding that to have too much resistance with the parking commission, so to speak. However, we are doing a traffic modeling study for this to make sure that with future development happening we can afford to take these lanes out of the street.

Shana:

Ok, are you working with public transportation though to increase access to downtown?

Anton:

Oh yes, certainly.

Eva:

Maybe time for one last question? //...// Well, Anton, thank you so much for that presentation. That was very informative. I just want to say thank you to you and Steve. Folks, again if you could put your phones on mute—I heard some background noise; just to maybe minimize that?

Slide 1

I'm going to run through some of the work that we're doing at the EPA—some of you know where we are and some of you don't, so just to kind of bring you up to speed or bring you up to date. And then I'd like to give people an opportunity to introduce yourself to each other because I think there are definitely some synergies that I'm hoping that these conference calls or webcasts can help facilitate.

Slide 2

So, first, I wanted to present an overview of what our program does. Our program, which we're calling the Heat Island Reduction Initiative (HIRI), and it's been in existence for almost a decade now. We work on doing three things: building capacity—providing education, mainly through our website, which is one of the only websites on the urban heat island that exists, and presenting some outreach materials...brochures, just general fact sheets. And then fostering networks is another thing we can do. Supporting conferences and workshops. These webcasts are a way that we try to do that. Secondly, we try to turn research into guidance because I think there's a huge disconnect between the audience whom we work with, which are generally local governments, and researchers, especially the air quality modelers and the urban climatologists. They're really speaking different languages, so we really try to bridge that gap where possible and provide some tools and guidance. And I'll talk a little bit about our urban heat island compendium later. And then we just try to stay engaged in what's going on and fill gaps. So, keep abreast of the current research, we work a lot with state and local governments. And, I'll give you an example through this Transportation Research Board sub-committee that we've just launched. Just to clarify, it's just me working on the program. I say we, but it's me—and I have some support with contractors and some co-workers help me out here and there, but I'm the main face of the program.

Slide 3

So, in terms of building capacity, I want to give you examples in each of those three areas. Our website, as I was saying, is one of the main ways where we provide education

and information about what we're doing. And, we're going through a revamp right now. The biggest changes are that we're going to take some of the detailed content off of the site and put it into PDFs that can just be downloadable, and just provide more summary information on those top-level pages, because, apparently, that's the way that people like to see information. They either print it out or they don't have time to read it, so we'll give them the one-page overview on a screen-shot, and then point them to a PDF that provides all of the resources that they might need on that topic. The other thing that I'm really looking forward to doing is, currently, every time we have these conference calls we do have meeting summaries and we post the PowerPoints, but I think it's posted in a very un-user-friendly format. And again, if you press F5 you can get a better screen shot so you can see, we tend to just list the calls by date. And, someone has to click on that to see who presented. And, I think now we're going to organize these by subject matter so that you can just click and see who presented on green roofs, and just click on that presentation right away. So, it will be organized by subject matter instead of the date, or now that we're moving to conference calls, the date of the webcast.

Slide 4

Next, in terms of turning research into guidance, we've been working on, or I've been working on, this urban heat island guide book for a long time and I'm sorry it's taking so long. One of the latest things that has happened is that we've changed from calling it a "guidebook" to a "compendium," because as we were working through it I was saying, you know, this is really not providing hand-holding guidance. I don't think that we're at that point where we can do that, but it is providing a good summary of information on the topic, and pointing people toward resources for more information, and examples of what other groups have done, because, it's best to go to a city to see how they've advanced cool roofs in their building code, rather than talking to me, who's two levels removed from it. So, that's one big change. Secondly, we're going to actually post the chapters as they become available. So, we'll get them to you sooner, instead of waiting for a whole compendium. I think that's another thing that's holding us up. We already have a cool roof chapter that looks pretty decent, and I think that we can post that in the next couple of weeks, and we'll probably have to make adjustments to it as other chapters evolve, but at least people can get the information that they want a little sooner. Just to reiterate, this compendium is focusing on the mitigation strategies...so, providing an overview of cool roofs, of green roofs, of urban forest trees, and some information on pavement—but there are some gaps, so I'll talk about that later. There will also be some material on the urban heat island phenomenon, the causes, the impacts, and I think one of the things that might be most useful is kind of an overview of the different activities going around in the U.S. Because I don't know how informed everyone is, it's just so hard to keep track sometimes. Lastly, now that we're talking about climate change, we're going to talk more about the connection between the urban heat island and global climate change.

Slide 5

So, lastly I want to point out, in terms of filling gaps, I don't know how many of you are familiar with the TRB, but it's a group that really brings together all of the transportation

professionals, transportation professionals, engineers, together in one forum. And, what we were finding is that there's a lot of demand and momentum for guidance on pavement. There is information available on roofing, for example cool roofing, even green roofing, and urban forestry. There are a lot of groups out there doing work in this area, but in terms of pavement there's a big void. Most of the research we've done in the past focused on solar reflectance. So, lighter-color pavements tend to be cooler. But, when you look at the implementation aspect, it really raises a lot of issues. What is the cost? What exactly are the benefits compared to a darker-colored pavement? What about other considerations, like safety, or the fact that pavements dirty over time?

Slide 6

So, we hired Cambridge Systematics, a consultant, to issue this cool pavement report. And, we launched a workshop where we brought together a lot of researchers. And, we also formed a partnership with Arizona State University and in past calls they've presented on some of their pavement work, and they really have extensive facilities for lab and field experiments, and they're working on developing the next generation of building and paving materials. They have a staff call and email help center, which is really just one person, again in that sense, but it is someone who's an expert in that area, and I was finding that I couldn't answer some of these technical questions and I really needed some assistance.

Slide 7

So, this partnership with ASU is really helping out in that way. What happened this year is that we were able to launch a TRB sub-committee called "paving materials and the urban climate." Anyone is welcome to join the sub-committee as a "friend," where you'll receive correspondence about what's going on. But there's going to be a core group of people who keep the momentum of the committee going, where we try to keep abreast of who's doing pavement research in what areas, try to get a call for papers going for the next transportation research board conference, which is always in Washington, D.C. in January—just to try to get some of the key questions answered.

Slide 8

That's kind of a very very quick overview of our program, and I just wanted to highlight some of the upcoming events that you might want to keep track of or just have in the back of your mind.

Slide 9

And lastly I just wanted to make one other mention of another program, this past year I launched with a co-worker called the Clean Energy Environment Municipal Network. The goal of this program...it's just an informational, peer exchange network. So, we're trying to advance clean energy. And, by clean energy I mean energy efficiency, renewable energy, and clean distributed generation. You could look at our website just to

see some of the stuff we're coming out with. In this program I'm also trying to launch a webcast series—instead of being quarterly, we're looking at it being monthly starting in February. I'll send information through the urban listserv group so that those who are interested can sign up for this. The first call will be on navigating the grant process—mainly the Federal EPA grant process because we've heard a lot of questions about that. So, that's our logo.

Slide 10

Lastly, I want to save the last 15 minutes of the call to kind of hear from you what's been your involvement and interest in urban heat island-related work and what's going on in your community. And, I already talked to Tucson, ACT, and Dallas to start of this dialogue. And, I'm sorry, if you have questions, maybe it's best to just email me and I definitely will respond. I just want to let you all have an opportunity. I don't want to hog the conversation. Irene, do you want to start off?

Irene, Tucson:

Sure, Irene, city of Tucson. They created a new position—the urban landscape manager, so, that's me. And, basically I work with a number of departments within the city. Probably about seven different departments. And, I think Eva summed up some great stuff on her slide about what she's trying to do with HRIs, and then the first being building capacity. And, I think that's generally what we're also trying to do within the city itself. The city employs 6,000 people and if I could even get to half of those people to understand what urban heat island UHI is all about, I think that's a big step forward. So, yearly we have an UHI conference that's geared toward city staff and also to committees, commissions, and boards, since they are making the recommendations to the mayor and council. Eva has participated in one of those last year. It was basically about roofs. What's happened with all of that is basically that the city staff has become much more aware about heat island and mitigation measures, and so it seems as though we're talking a lot more about it amongst ourselves. The other thing that happened within the city was the manager created the office of conservation and sustainable development. And so, they've been very much involved in climate change issues. So, very similar, and almost together in what we're doing. But, of course, what I'm trying to do is relate it more toward the UHI issues and how to mitigate those within an urban environment. And as we proceed, we have also teamed up with the ASU Smart Center, so Jay Golden and Chamile Commish has also come down to Tucson. And the city itself is also doing some work with porous concrete, as well as work with looking at the green roof issues. So I'm glad I have a contact in Seattle, Steve, because I've been following your Green Factor quite closely—being where the city can potentially implement some codes for new development. And then, I have also heard about Houston and what you're doing in terms of your vertical gardens. But that also I think, the city has been really great and working with the transportation department. We're in the conceptual stages of a roadway project, which will be detached and have 20-30 ft high retaining walls. So, we're looking at the idea of vertical walls to reduce heat capturing within those very concrete and asphalted roadways. I guess that sort of sums it up.

Eva:

Ok, thank you.

Jared Lou, ACT:

We are a coalition of about 150 organizations in 39 states around the country and Canada, and we mainly work to promote the work that those organizations are doing. We are a research consumer, so calls like this and work that the Forest Service is doing, the work that the EPA is doing, a lot of the work that the community here is doing, we pay attention to that and try to filter it out to our members so that they can put it to work in their local communities. We do some national advocacy work on the Hill. We worked on the Energy bill last year to try to make it more tree-friendly, to try to make it more economics and community development oriented, and maybe lastly I'll mention that we do things like this webcast as well. We have a monthly series called the brownbag lunch series. Some of the calls would be very similar to this type of topic and some wouldn't. Some are geared towards how to start a tree group. And some are things like getting into green roofs, partnerships with utility companies, smart growth, trees and transportation—so there are a number of issues that overlap a lot with UHI. So, I would welcome anyone to sit in on those, they're free. You can find out how to register on our website. If you can't find it, email me, because we are working to arrange the website so it's a little more obvious where it is. We have things like Community Tree Leadership Forum, which is a partnership with the Arbor Day Foundation for how to operate a tree group. So, various trainings and electronic mediums like that as well. So, I'd be happy to answer any questions about what we do, or field anything else. Feel free to call me off line too if you'd like to join our coalition. Thanks, Eva.

Caller:

Sorry, could you re-cap who you are and where you're from.

Jared Lou:

Sure, Jared Lou, from the Alliance for Community Trees. We're in College Park Maryland just outside of D.C. but we work with about 150 different organizations around the country, mostly non-profits, but some city or other municipal tree organizations.

Jeff King:

Are you working at all with Gary Allen?

Jared Lou:

In Annapolis, the Center for Chesapeake Communities?

Jeff King:

Right.

Jared Lou:

They are a member.

Jeff King:

Ok. He last week called me and said last week he was trying to organize a big Washington area metro tree canopy management meeting on February 20th. If you haven't heard about it, you might want to pencil that in.

Eva:

And I'll add that those webcasts, the ACT ones, are really fantastic, so I can send it out on a listserv. And next, Dallas. Is Steve Howser on the line?

Steve Howser, Dallas:

Yes ma'am.

Eva:

Can you introduce yourself?

Steve Howser, Dallas:

My name is Steve Howser. I am the chair of the Dallas Urban Forest Advisory Committee. I am also a consulting arborist by profession. A brief amount of history is not all that pretty in the city of Dallas, I guess. But, our number one objective in the city has always been more economic develop or related competition between the city and suburbs. There's never been a formal forestry program in our city, or an effort to manage our urban forests. Or, even any city-wide effort to plant trees that we've lost due to development. Area growth patterns are more geared towards sprawling outwards with hard-scapes, instead of with smart growth or building up-and-down. So, in other words, we're starting to learn, and starting to catch-on in the area. Around 12 years ago we were able to enact our first tree ordinance, but it was fairly ineffective, primarily due to concerns of its effect on development in the area. So, around five years ago we were able to enact some positive changes to the tree ordinance, but there were still a few loopholes that were left, which allowed trees to be removed without being mitigated, which is a concern. I'm trying to be brief, but around three years ago, thanks to a grant from the Texas Forest Service, we were able to convince city council to hire our first urban forester, which is a big step forward. Around the same period of time, thanks to strong support from Mayor Laura Miller, we were able to establish the Dallas Urban Forest Advisory Committee as a permanent part of city government. We decided not to be a board or a commission due to the politics involved. The city of Dallas is a council district-type of government, and the district people tend to want to do more what's best for their district than what's best for the city many times so at times it's difficult. So, since the establishment of the committee, we're still in the stone-ages, I guess would be the briefest way to describe it—we're learning how to rub two sticks together to create fire. But you can find out how far we've come if you want to visit our website, it's very simple to remember, it's just dallastrees.org. That's dallastree.org. Our number one objective in urban forests is the urban forests survey and analysis—we can't manage an asset we don't fully understand, and we have to have the baseline data, obviously. Many of you folks are well-aware of that. So far we've raised 80,000 dollars, which we're proud of to get that accomplished. I'm also an advisor to the Vision North Texas Partnership, which is working to plan our future regional growth. And, I've recommended a forest survey inventory and analysis for the entire region. However, if

you want to find out what we're doing as far as planning in the area of growth, we're expected to double in terms of population in the next 20-30 years. The website for that is fairly simple. It's just vnt@planforaction.com. Other current objectives include establishing a department of urban forestry, obviously, and a significant budget that would help to support that. Many other objectives and goals are listed in our current 2008 work-plan, as well as our two-to-five year plan. So, more to the point, word of the heat island effect came to the Dallas area in 1995. Being a long-time contributor and friend to tree issues, took an interest and funded at least in part if not all of the first study of the Dallas heat island problems. It was done by Dr. Ken Morgan with the Dallas Christian University, and I can forward a copy to anyone who may have an interest in it. So, this was done in 1995. We thought it was big news—took it to the media, which basically had no interest at the time because it was deemed to be anti-development, which wasn't good for us, we thought it was significant news many years ago. When Laura in the Office of Environmental Quality decided to complete another study recently, I was thrilled to see the interest that was expressed, as well as, once the study is complete, we'll be able to compare 1995 to currently. So, David Hitchcock, as well as others involved from the EPA and the Office of Environmental Quality have provided an outstanding education to me, anyway, on many different subjects that include air quality—which we're locally struggling with our state implementation plan, which has not been approved by the EPA. So, much of what I've learned, few arborists or foresters in the area are fully aware of many of these issues. So there's a great need to educate many of the people in the state of Texas. So, in conclusion, we've come a long way in the last few years. But, man do we have a long ways to go to catch up.

Eva:

Thanks, Steve, that's a great update. Since we only have three minutes left on the call, does anyone else want to introduce themselves? If not...

Ash, CARB:

What I'm going to encourage is that I'm going to be sending to Miss Wong a carbon calculator, and I want to encourage every one of you to use this carbon calculator to begin to establish GHG signatures for buildings that you're sitting in. The other thing that I want to encourage is to begin surveying appliances of all sorts, including refrigerators or whatever else may be near you, and try and establish climate change or GHG signatures. One thing I want to kind of make clear, and I'm going to write an email to Miss Wong on this issue: from now on, in order for us to make progress, any progress at all, including getting monies, grants, and all sorts of things, we need to be talking either in tons of carbon, or tons of Eq carbon, or in Watts/sq meter. And, unless we can generate data like that, we're not going to get the necessary attention and the necessary resources in the struggles that are going to be forthcoming for this well-deserving area.

Eva:

Thank you, Ash.

Caller:

Eva, will you be forwarding that information to all of us?

Eva:

To be honest, I will forward everything that I can. What I can't, I will give the email address list to, and maybe ask that if there's something that's a little sensitive that, you know, might put me in a difficult position, I'll let you send people that email, if you understand.

Caller:

Could you just give us Ash's email and we will descend upon him.

Eva:

That's another way to do it. But I will make sure that you can get the information. It might not be directly from me, but I will follow up. I guess just in conclusion. I would really appreciate hearing back. Is this webcast format a good way to go? I assume all of the people who were on were able to get on. But, if you know people who had difficulties, let me know because I need to know if this is a good way to continue to proceed. Also, if you like hearing from each other, should we make it a point on every webcast to have that kind of a forum? Feedback would be great. Thank you everybody. The next call will be in April. I already have some presentations in mind. But, if there's something that you want to hear about, or if you have a suggestion, then feedback is always welcome, so please let me know.

It's 3:30 and I'm just going to end our call now, and just thank everyone for participating.