



Sustainable, Healthy Development – the ACT way

**A forum of keynote speakers invited to the
'Focus On Business' Conference, Canberra,
Wednesday 13 September 2006**

**Health Series
Number 41**

**Health Improvement Branch
ACT Health**

ISSN 1325-1090

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Publication No 07/0462

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Introduction

The Focus on Business conference is a premier business event held in the Australian Capital Region every two years. The conference brings together business from Canberra and the surrounding Region to showcase, network and promote Canberra and the Region nationally as a world class business destination and an outstanding place to live and work. The conference was held from 13 - 15 September 2006 at the Hyatt Hotel in Canberra.

The Forum entitled '**Sustainable, Healthy Development – the ACT way**' held on the first day of the conference, provided an opportunity for delegates to hear from and question a range of people from local business, government, industry and the CSIRO involved in urban design, development and construction. Forum speakers provided ideas and added to the knowledge base about the built environment in an urban landscape, its link to sustainable development and its impact on health and wellbeing.

Forum speakers included Dr Paul Dugdale, Chief Health Officer, ACT Health; Mr Johnathan Efkarpedis, Director, Efkarpedis Group; Mr Michael Costello, Chief Executive ACTEW; Mrs Anne O'Donnell, Australian Ethical Investments; Dr Matthew Beaty, researcher from the Division of Sustainable Ecosystems, CSIRO.

This monograph contains their thoughts and ideas on the built urban environment as it relates to Canberra and its people.

Foreword

Canberra is a world-class global village. Our challenge is to ensure that Canberra's development makes our community healthier and leads the world in knowing how to do this. That requires sustainable infrastructure, sustainable development and sustainable business. There are many aspects of business and industry that impact on the health and wellbeing of people. The planning, design and construction of the urban environment is a good example. The Focus on Business conference provided an opportunity through a Forum entitled **'Sustainable, Healthy Development – the ACT way'** to look at the impact of development, business and infrastructure on the health and wellbeing of people.

I commend the contributions in this monograph to you and look forward to future opportunities for collaborative work to develop these themes.

A handwritten signature in black ink, appearing to read 'P. Dugdale', written in a cursive style.

Dr Paul Dugdale
Chief Health Officer
ACT Health

Master of Ceremonies

Dr. Paul Dugdale, ACT Chief Health Officer

Dr Paul Dugdale is ACT Chief Health Officer and Associate Professor of Public health at the ANU Medical School. He has a medical degree from Flinders University, an MA in sociology from ANU and a PhD in Public Health from Sydney University. He is a Fellow of the Australasian Faculty of Public Health Medicine and a member of the National Health and Medical Research Council. As an executive in ACT Health, Dr Dugdale manages emergency preparedness, health promotion activities and health protection services. As an academic he has research interests in health financing, management and regulation. Previous positions include Director of General Practitioner financing in the Commonwealth Department of Health, planning and hospital administration in NSW Health, private secretary to a Commonwealth Minister for Health, and several years as a part time General Practitioner.

This forum is about sustainable healthy development the ACT way. We are trying to get across a message that public health is in everybody's interest. I'll start the session with a talk on Canberra as a global village and the sustainable healthy development of a global village.

There are three contexts to this aspect of Canberra today: policy, ethical and scientific. So, starting with the policy context, I am a government official as well as an academic. As an official I can say that while governments of some cities don't play much of a leadership role, in Canberra ours certainly does, and our moving to self government and the creation of a government for the ACT jurisdiction has been a great challenge and a great opportunity for this city.

The current government's economic White Paper notes that a strong and productive economy must build upon and be supported by a healthy environment and a healthy society. That is right up the front, one of the first principles of the economic White Paper.

The Canberra spatial plan sets out the values and principals of a sustainable healthy city. Now these are just words in one sense but they are words that direct the energies of government, and of the private sector as well if it so chooses. The spatial plan calls for Canberra to be a livable city, enjoyed by all, an international city with a dynamic heart, and a city of choice, where the natural and cultural environment is respected and protected. It's also aims to create and maintain a healthy community.

The aim of the social plan is to invest in children and young people, to meet the health needs of an ageing population, to focus on prevention and early intervention, to develop sustainable social care supports which relate both to the elderly and children, and to support an active lifestyle at all stages of people's lives. This is all particularly Camberran but it applies to many cities in the western world that have an ageing population as we do.

Moving on to the ethical context, the key questions from a public policy point of view are: why should we care? and what should we do?

To begin answering those questions I would like to quote Tony McMichael, the Professor of Public Health in the ANU Medical School, where I am an associate professor. We are lucky to have a man of his stature in this town. He is currently in South Africa at the United Nations global commission on climate change, on which he is their medical expert.

This is a great quote from him: "Humans are collectively overloading earth's capacity to supply, absorb, replenish, and stabilise. This poses a profound and potentially irreversible form of non-sustainability."

This is a systems view of the earth, that it supplies resources that we use. It absorbs the residues from what we've used, it replenishes itself and it stabilises things both climactically in the oceans, in the soil and in the atmosphere.

So the gift of the universe to us really is the earth and its capacity for these things in a systematic sense. If we overload that capacity then we've got a problem. But what's the problem? Should we aim to preserve the environment at the expense of human wellbeing? This is a debate that's been going on for several decades. We are trying to propose that is shouldn't be a conflict between preserving the environment or development for human wellbeing. We need to understand population health as the long-term bottom line. This is not necessarily an environmentalist approach. It's not a wildlife preservationist's approach either; it's a population health approach.

As the talk goes on you will see why I think that this is the only really ethical position that we can adopt in the world. Here's another quote from Professor McMichael: "Ecological sustainability is not just about maintaining flows from the natural world that sustain the economic engine, nor maintaining iconic species and iconic ecosystems. It is about maintaining the complex systems that support health and life. Population wellbeing and health understood thus become the real bottom line of sustainability."

This is contested, the debates are going on in the United Nations, but Tony and people who think like him have largely won them over in that forum. I think it's increasingly going to become the rhetoric of sustainability.

Let's move on from the ethical context to the scientific context. We have Matthew Beaty as our scientific presenter today. He is a different kind of scientist than me, probably more of what you think of as a scientist. I am a population scientist and here are the sorts of facts that get me excited: the world population is currently at six billion people. We will plateau at nine billion people in 2070 and numbers will decline thereafter.

We are pretty sure of these figures and it's an amazing piece of demographic modeling to be able to offer these sorts of scientific insights into the world population. But with the age profile of the population we have now in the world, with the fertility rates, and with the increases in longevity that we are seeing, we can model it fairly accurately.

So, we are living through the period in world history with the highest population the planet will ever see. That gives us a special place in history and we have to respond to it. Our colleagues in economic disciplines are forecasting the world Gross National Product (GNP) will increase four fold over the same time period this century, an estimate regarded as conservative. However, the forecast could be interrupted by war; GNP growth is dependent, as is the population growth projection, on a relatively peaceful world such as we've been experiencing in the latter half of the 20th century.

Just to digress a little, I'll be talking shortly about urbanisation and how it influences the state of the world. As the world changes, so does the nature of conflict. War is not the same now as it was, or as we were accustomed to, in the first half of the 20th Century.

Of course there is always a war somewhere in the world, but with the gradual urbanisation of the world we are now seeing wars that are pretty odd; Australia is at war with Afghanistan, with Iraq, I mean what are we doing there?

There are always going to be geo-political answers to those questions but from a general point of view I think it's become increasingly odd and the sorts of wars we are having are increasingly odd – particularly because the peaceful development of population and trade and culture has become much more the norm worldwide.

But back to the issue; GNP will increase four-fold, fossil fuel, particularly coal, will not run out within the next couple of hundred years – though we may soon want to convert it into liquid or gaseous fuel - the world economy will continue to grow and it will probably be based on fossil energy for the foreseeable future. Hopefully we can change some of those things. If we don't do anything, that's the scenario that we face.

Now, let's put some numbers into the cities to give this perspective. The world's urban population has grown from 2.3 billion in 1990 to three billion in 2003. That's another 700 million people living in cities now than were living in cities in 1990. This is even happening in Australia. We probably thought we couldn't get more urbanised, but in 1990 there were 14.5 million people in Australia's cities and now in 2003 there are 18.3 million. That's almost four million more people in our cities in just 13 years.

Urbanisation is the current trend of humanity, and sustainable healthy urban development is the issue. The human organism, the human population, didn't evolve in an urban environment; it evolved much more diffusely spread across its environment. So urbanisation is new for the human species, and it confronts human population with what Tony McMichael called the Urban Penalty - infectious diseases, depression, obesity, and climate change.

Infectious disease is the corollary to the cheek by jowl nature of cities, producing much greater opportunities for bacteria and viruses to spread. Increases in depression seem to have accompanied urbanisation and we are only just starting to understand that process. The epidemiology of mental health is one of the disciplines in medicine that has developed from the ANU, from the work of Scott Henderson and colleagues who set up the Centre for Mental Health Research in 1975.

Obesity is an urban penalty that comes on the one hand from the very ready availability of food - and the particularly energy dense and processed food in cities - and on the other, the capacity to get by with very little physical activity in cities.

Climate change, and the attendant health problems that that may bring about, is a result not just of greenhouse gas emissions, but also some of the local effects of cities too.

This is another quote from the ACT Economic White Paper:

“The problem is not that cities have problems, a city without problems would have no people living in it. But the problem solving strategies have broken down. There is not so much a shortage of investment as there is a shortage of imagination. And this is a call to imagination and creative solutions to these problems.”

So what's our solution in Canberra?

Canberra has an imaginative approach to sustainable and healthy development. This seminar today is focusing on those imaginative approaches.

We are going to have a look at the infrastructure, property and finance sectors. Just to put that in context, a pie graph of the ACT Gross State Product by industry shows my own sector, Health and Community Services, contributed 6.1% to the local economy. The construction industry contributed around 7%, property and business services 14%, finance and insurance 4% and electricity, gas and water supply 3%. The biggest contributor is, of course, government administration and defense (27%).

There are 14 other contributors but this selection of figures puts us in the picture.

The speakers today will elaborate on these themes but the challenge from a public health point of view concerns infrastructure. We are going to talk about water infrastructure, which should minimize infectious disease risk both from drinking water and from sewerage and runoff management - you can get risks at either end. We need to minimise our ecological footprint by maximizing recycling to our river system, preferably so it's cleaner going out than flowing in.

That's the challenge for our water infrastructure. Other infrastructure needs to creatively address greenhouse emissions. As I say, we're not particularly strong on that in our thinking yet in Canberra but that's another challenge.

Urban development should increase the footprints on the ground by encouraging physical activity and contributing to a quality of life through a culture of inclusion and zest. That is the way urban development contributes to the public health and that's the challenge. As an aside, if we look at those increases in GNP that are going to come to the planet, and that we as a country (or at least our governments) want to participate in, we should acknowledge that the developing world also wants to participate in those increases. If the increases in GNP come through knowledge, culture and services, they draw on and support the world's growing human population. However, the addition of this extra activity to the economy does not necessarily use up additional resources from the environment. So, the more that GNP growth occurs in the knowledge, culture and service sectors, the more it will draw on and be a nurturing thing for our human population.

A wealthy city, which Canberra is, should lead the way and reach out to the world. We should export ethical investment in sustainable healthy development. This is what the wealthy cities in history have always done; they have always been exporters of their culture, of their ideas, of their vibrancy. If we are going to make a claim that Canberra is one of the top small cities in the world, then we need to be thinking how we export those values in a practical way.

As a thoughtful city, we should research how to improve urbanisation. We should strive to understand our city, its sustainability and its population's health. Canberra is a great research centre nationally and if we are going to emerge as a great research centre internationally, I think improving urbanisation should be our focus.

Finally, the notion of Canberra as a global village is a phrase that has captured my imagination. I know it's a bit of a twist from the original use of the term but it has got the right kind of feel and carries the right values for Canberra. The ACT has Australia's lowest rate of obesity, but we also have the highest rate of malaria, because our population is the most internationally traveled. So there you are, I thought I'd better finish off with a couple of public health physician facts about Canberra.

It's an interesting city, it's an interesting population, and we've seen the world. Now it's time to show the world our leadership and the sustainable healthy development of livable cities.

Mr Johnathan Efkarpidis

Mr Johnathan Efkarpidis is the Executive Director of the Molonglo Group. The Molonglo Group successfully rejuvenated the Belconnen Fresh Food Markets, which now boasts to be the most successful food markets in Australia. The Molonglo Group is currently working on a large mixed-use development on the old Acton Hotel Site in West City. NewActon will have over 300 residential apartments, Canberra's first boutique hotel, a hospitality hub and commercial offices, further reinforcing the Griffin Legacy and revitalisation of Canberra Central.

As we all know, Canberra was designed by Walter Burley Griffin, an American architect who designed houses and imagined cities. Walter's plan of Canberra was for a city that would have a vibrant heart and make the rest of the world envious. Unfortunately along the way we inherited the Y plan, the development of the town centers, at the expense of the city. Cheap petrol and the Australian dream to own our own home in the suburbs, left Canberra, and many other parts of Australia, to adopt the car as the main source of transport. Get up in the morning, drive to work, get back in your car and drive home. This is probably the most isolating and uneventful experience in our daily lives. Urban sprawl has made us reliant on cars, which carry a lot of blame for the health of our society. Not only do they cause pollution, but also they may even lead to the rise of obesity and social isolation.

It's good to know that Paul said we have the lowest obesity rates in Australia, but I'm sure we can do better. I mean, we no longer communicate with each other. Instead, we drink, to break down barriers, and if you live in Canberra you may even drink under the influence.

In a recent article in the Bulletin, there were ten reasons for long life. One of those that really caught my attention was; drive the safest car you can afford, and drive sparingly. There are about 1600 road deaths each year on Australian roads. We need to understand that our built form affects how we travel to and from work, how we interact socially with each other, and how we feel about ourselves.

Much of the debate in Canberra in recent years has been about increasing use of bicycles, public transport and connecting the city to the lake. As Canberra reinvents itself, in the next five to ten years, I'd like to believe that I would be catching a tram to our neighbouring town centre.

When I was quite young and still at school, I once heard someone talk about the social norm about how one should ride in an elevator. You enter the lift, you put your back against the wall, and you face forward. Try facing the other way and the other passengers in the lift feel very uneasy. Since my move into an apartment about ten years ago, I would test this theory on a daily basis, face the other way, and see the reaction from my fellow urban travelers.

What I did notice over a period of time was that the lift became the social meeting place of the apartment.

“Good morning Johnathan, what are you up to today?”

“Did you manage to fix your car?”

“How do you feel? I feel terrible today.”

“We must catch up for a drink soon.”

For me, the lift is the urban meeting place of the future. No longer was my experience of going to work an isolated one, there was the social interaction from the moment I left my front door. This was not with my car, it was with real people, real Canberrans.

In addition to the lift, we have the café. The café has become the new lounge room. We now meet business colleagues and friends at the local café, rather than meeting in the office or at home, especially since our homes are becoming smaller.

How does this all affect our health in our society? Why is it that suicide rates in Australia are higher than Italy or Greece? When I think of my experience of growing up in a Greek family, and visiting many southern European cities, I realised I could look out the window, walk onto the balcony and my neighbour knew me by my first name. Even if I was standing in my underwear.

Now this is another step forward for Canberra. In recent years we have seen a development of medium and high density living, which I believe will lead to better social health. This is not to say that living in a densely populated place reduces suicide rates and makes us happier. One perfect example is Tokyo, Japan, probably the most densely populated place in the world. Yet high suicide rates still exist there. But is this not more of a cultural thing other than the built form? There is no doubt that the built surrounding has a strong influence on how we feel. Take for instance these words from Alain de Botton, from his book ‘The Architecture of Happiness’:

“Sensitivity to architecture also has its more problematic aspects. If one room can alter how we feel, if our happiness can hang on the colour of walls, or the shape of a door, what will happen to us? What will we experience in a house with prison-like windows, stained carpets, tiles, plastic curtains?” And again, some more words. “Architecture is perplexing too; in how consistent is its capacity to generate its happiness on which its claim to us is unfounded... There are other times when the most congenial of locations will be unable to dislodge the sadness.”

Young people from Canberra feel that they need to go to Sydney or Melbourne to get a job, believing that the opportunities are better, and that they will be happier living in a more urban surrounding. Did you know that Canberra has one of the lowest unemployment rates in Australia? That we have one of the top universities from around the world located right here in Canberra? The urban environment is changing in Canberra. It may change our psyche and our enthusiasm for our city, and hopefully make us all happier and healthier people.

The National Capital Authority has recently released its grand vision of this city, which is about completing Walter Burley Griffin's original concept of Canberra. It focuses on bringing the city to the lake, connecting the ANU to the heart of the city and widening the pedestrian footpaths and boulevards. The boulevards will become as grand as Paris, and as vibrant as Tokyo. I urge everyone to go and visit the model at Regatta Point that was created by the NCA, to see what Canberra would like to be like in the next five to ten years.

The new project that we are currently working on, and we have spent a lot of time developing this over the last seven years, is due for completion in mid 2007 for the first stage, and mid 2009 for the second stage. This will include more than 350 residential apartments, a beautiful 75-room boutique hotel, some food providers, galleries, art, day spa, commercial office space for the ACCC and much more. All this is being designed by Melbourne architects. This site is unique in that its interaction between the new and old buildings has been well considered.

I believe that the Acton urban dweller will be living in his new apartment in the heart of the urban village, will be walking to work, socialising at one of the many local cafes, contemplating the public art that will surround this site, and share experiences with many of the artists, students and visitors to Canberra.

When architects look at buildings they say 'what great architectural genius'. Honestly, when I look at a building, I look in awe and say 'what a great hub of activity, a place where Australians and Canberrans can meet and rejoice in our existence'.

My suggestion, is that the next time you ride in an elevator, say hello and face the other way. Walk to work, take the time to see our fellow Canberrans live and play in this new playground as Canberra goes through its facelift. Perhaps we will live longer, not because medicine has kept us alive, but because our obesity levels are lower, pollution levels are lower and social isolation is a thing of the past.

Mr Michael Costello

Mr. Michael Costello is the Managing Director of ACTEW Corp Ltd. He is Chairman of Ecowise Environmental Pty Limited and a Member of the ActewAGL Joint Venture Board. Mr. Costello was previously Deputy-Managing Director of the Australian Stock Exchange and a Director of Export Finance Insurance Corporation and the Australian Trade Commission. He was Chief of Staff to both the Opposition Leader, the Hon Kim Beazley MP and the former Minister for Foreign Affairs, the Hon Bill Hayden MP. Mr. Costello was Secretary of the Department of Foreign Affairs and Trade and the Department of Industrial Relations. He has held a number of diplomatic posts including Ambassador to the United Nations. He received an Order of Australia (AO) in 1996 for international relations. Mr. Costello was appointed to the ACTEW Board on 14 August 2002.

When we talk about public health and sustainability, I suppose there has been no greater single contributor to public health than what happened at the end of the 19th century and at the early part of the 20th century - the development of large scale water treatment facilities, to provide high quality potable water, and the development of high quality waste water and sewerage treatment.

That has been the single greatest contributor of all to people's health. And of course, because it's so well known, it's just taken for granted. Well, I think it's taken less and less for granted now. Over the last few years, the whole debate about the use of water, wastewater, the drought and so on have dominated political discussion and public policy discussion. Certainly I think it's going to dominate discussion in this city over the coming few months I regret to say.

So what's the story? I thought that instead of going through my usual spiel, today I'd draw a contrast between a couple of things. One is the complete difference between an inland city and a coastal city. Canberra, well it's obviously an inland city, and that has some pluses in certain areas. The big plus is actually in recycling, which is all the rage at the moment.

If you think about the ACT, not as an area bound by a political boundary but as part of and situated at the upper end of a river system, then you will think very differently about recycling. Now about 7% of our water is recycled in the conventional sense, that is, its sewerage is treated, its water is treated, it is sent out to water some grapevines and sent out to some playing fields. That's the conventional way of thinking of it.

But the truth is, unlike in a coastal city, where when you've treated water in your sewerage system, you either put it back into a river 5km up from the sea and it goes out to sea or you put it in a great big pipe and it goes out to sea, for an inland city water management is quite different. We take our water from the mountains, or from Googong, we use it, it goes through the lower Molonglo, and then it goes straight into the river system.

If a wonderful resource like water could ever be considered to be wasted - I guess the sea doesn't think it's wasted, but it's not available for human consumption again, or for use in agriculture or industry - then a coastal city wastes water. Water for an inland city is essential to the health of our river system and we have to consider people will use it downstream. We in the ACT recycle nearly 50% of the water we use. Nobody else in Australia does that, not even close.

But if you think about us in the way you think about a coastal city then you won't understand that ability – that need – to recycle. We take it out of the river system here, and a few tens of kilometers down the road we put it back in, better than when we took it out. You can go and see the four platypuses about 150 metres down from the outfall of lower Molonglo. They've been there a long time, obviously living healthy lives, and are breeding well. The water can't be too bad.

Some people have been game enough to drink it. But I think we'd need a bit of ultraviolet treatment before we did that. But let me say, ACTEW has been examining and doing the technical studies about what we would have to do, *in extremis*, to treat and pump that water back up, at vast expense, into our dams for consumption again. I stress we are only doing the studies, it's not in our plans to do it at the moment.

The coastal cities of course have an absolutely massive advantage. They have the biggest storage area in the world right next to them. It's called the sea. They don't have any shortage of water; it just has salt in it. I know what I would do if I was in Sydney, I'd be building a great big desalinisation plant. They cannot run out of water. In Canberra, we can run out of water if there's no rain. That's the big difference between our situation and that of the coastal cities. If you build a desalinisation plant as a back up, you won't end up in disaster. You don't want 4.5 million people running out of water, not being able to wash and shower and all the rest of it. But desalination is just a point of view, and not necessarily the most popular one.

We in Canberra, however, rely on rain. It doesn't matter how many dams we manage to build here, we still have to have rain. We have enough storage spaces there right now, there's just no water coming into them. The last five months, have been the worst five months of inflow in recorded history. This drought in Canberra is worse than the federation drought, which I recall lasted longer than this one, but in intensity it's worse.

Let me foreshadow to you that the chances of us not having water restrictions here in summers are virtually nil. We will have to have them, most certainly, unless we get a lot of rain in the next six weeks. We are at 50.2% capacity in the dams, courtesy of our Cotter/Googong bulk transfer system. With this system we transfer water from a reasonably good catchment across to the Googong, which has had no inflow virtually whatsoever for the last six years. And that is our biggest storage area.

So, what does this mean in terms of our water supply? Well the truth is, and you wouldn't know it from the breast-beating and the self-flagellation that goes on, but we use very little water in cities and towns. The cities and towns in Australia use less than 10% of all the water used in Australia. Nearly 70% is used in irrigation areas. You can make your own judgement as to whether that is a wise allocation of resources. Apparently, growing cotton and rice in a land short of rainfall is considered good sense. I don't know.

Here's a good example of what's at stake. In 2003 Sydney and Newcastle's combined populations of 4.5 million people used 630 gigalitres of water while a small number of dairy farmers on the NSW side of the Murray Darling used 2100 gigalitres to flood pasture. And this is an industry where the Federal Government offered dairy farmers \$1.8 billion, funded by an 11 cents a litre levy to be paid by us, to leave the industry. You work that out.

These are things not often said publicly because they seem to be attacking farmers. I am not attacking farmers; I am simply stating a clear uncomplicated fact. We in the cities, we in our homes, use relatively little water.

In Canberra, we are better than anybody at this. We release over 95% of all the water flowing into or generated from the ACT. Its goes straight down the river and out the other end into NSW. Of all the water used from the Murray Darling Basin, we use only 0.3% of it. We are not really the heavy user of the system. So next time you get upset about it, we are not overusing or misusing water. Even from our dams and our storage areas right now we are required to release water, even though there is basically no inflow. Why's that? Well, we wouldn't have a lake if we didn't.

Talking about the lake, there is no flow into the Molonglo that supplies it all, except what's coming out of the dam. Between the Corin Dam, Bendora Dam and the Lower Cotter Dam, we are regularly required at various times under the environmental flow guidelines to release very substantial amounts of water. All this water in the past used to flow on over the Lower Cotter Dam and river, some of which we catch now at the end through the Cotter/Googong bulk transfer.

So we are meeting our environmental and conservation demands pretty well. But there is another way we are required to meet them. The government set a target of reducing water consumption per capita by 12% by 2013 and by 25% by 2023. Finding those savings will have to focus on water use outside the home. It's pretty clear from water usage patterns that use inside the house, like washing up, toilets, etc, is pretty constant. There is not a lot of variation. It's not an elastic demand, as the economists would say.

But over 50% of the water consumed in Canberra is used not the home but outside, and most of that is used in summer. That's the area where the big savings are to be found. Part of those savings are going to come from the Permanent Conservation Measures we have in place, which we hope will yield a saving of around 8% of that 25%.

I would like to see a really major push on irrigation, including new irrigation methods, for water used outside the home in Canberra. There are tremendous savings to be made. If any of you are interested, at Rosary Primary School we put in a big demonstration project and we spent \$80,000 on it. All around Canberra we are undertaking demonstrations to big users to show how, with much more refined irrigation methods, they can save huge amounts of water.

I have to tell you that if you really want to contain demand, there is one sure fire method, and it's probably the only reliable one in the long run. It's called price.

Our studies show that the inelasticity of demand, even on the outside, doesn't really cut in seriously until water costs about \$2.40/\$2.50 a kilolitre.

So, to achieve per capita reduction in use, it's my belief that these price rises will have to come eventually. Up until a couple of years ago, when the government first instituted the Water Abstraction Charge (known as the WAC), water was free. ACTEW actually doesn't own the water, what we charge you for is simply the massive investment in assets to clean the water for potable use, to store and clean the water when it's wastewater, to supply it to you and to operate our systems.

That's what we charge you for. We don't own the water, it's owned by the government, that's you. They are now charging 50c a kilolitre, and if there was any major price increase to meet a reduction in demand requirement, that would not go to us, just in case you were thinking I'm looking for an advantage to my bottom line. The money would not go to us; it would go to the government. I think all round Australia, this issue of how to use price to restrain demand is going to have to be faced. Both in the cities, but especially, surely, eventually in the irrigation and rural areas.

ACTEW is very engaged in the catchment areas. What happens in the catchment is vital to our wellbeing. The fires were a disaster for us, not only for the catchment and the environment and the health of the plants and animals, but from a water availability point of view. The fires significantly reduced the amount of water that will run off into our dams by something like 15% a year and that effect will last for another 30-40 years. Why's that? Well, as it revegetates, the catchment sucks up huge amounts of water for the new growth, and that will last, from Victorian experience, something like 40-50-60 years. It's a big problem we have to deal with.

We undertook a major examination of what was needed to provide some sort of water security for Canberra based on economic, social, and of course environmental sustainability principles. You have already heard some of the environmental issues, which put great constraints on us and lower the amount of water available to us.

On the economic side, we have said there is no need to build a new dam until 2023, on the basis of certain assumptions. I hope that turns out to be true because at the moment, construction costs and infrastructure costs are so unbelievably high, and so scarce the resources needed, it would be a very expensive proposition, far higher than we estimated even a year ago.

Construction costs have gone up in civil engineering projects well over 30% in the last 18 months. That's very frightening for people like us who build very large structures. We will never be able to drought-proof our inland city because we depend on rain. Mind you, we could build a pipeline and pump from Sydney or the coast up to here, but I think the cost of that would be almost beyond belief because unlike taking it from the mountains, it wouldn't be gravity fed. That means we have to have restrictions, and Canberrans so far have accepted the idea that, in difficult times, 5% of the time, we have to impose restrictions.

We know those restrictions basically impact on your gardens, particularly lawns, and public and private amenities, like school playing fields, golf courses, and so on. We have worked very hard with many of those places to find ways to get their water use down in a way that they can still survive and do better. I think the work we have done with public school ovals means that restrictions this time round will not cause them to suffer nearly as badly as they did in the past.

There are other ways of saving water. You can install irrigation, though it's expensive. My view is, in the end we will not be looking at supporting water tanks so much, or showerheads. Instead we will support irrigation, which actually reduces your first use, actually adds to that reduction of per capita consumption. It is expensive to put in new, good quality irrigation. Such things though do always get less expensive with time, as they become more widespread and more competitors come into the field, but at the moment its not inexpensive.

We have devised, for now, what we think is economically, socially and environmentally a very good way of meeting our immediate water needs. That is, by transferring water from a normally very good catchment up in the mountains, which has a relatively small storage area so water just flows over in very large amounts and disappears down the river.

We want to transfer some of that water to the Googong Dam and through our reticulation system, which I don't think anyone in the world, has ever done before - to keep a very poor quality catchment and to try and fill that up. Now we've got that back up to over 50%, which is a big change from the 34-35% which it was only about five months ago. That is a very significant plus for us. Now if we could just get some rain in the mountains over the next six weeks, it would make a big difference. We normally do at this time of year, but normal doesn't seem to apply anymore.

We are fortunate to have extremely high quality potable water, a ferociously aggressive public health system, and a group of public health officials to keep it all that way. We are looking at a new source of water, which we will draw from the Murrumbidgee, which we have never used before. At the moment, the Murrumbidgee simply flows in one end, gathers more water as it comes through, and flows out the other end, untouched. We are thinking of taking some small amount of water from that river. I think about 360 gigalitres a year flows down that river untouched and we are thinking of taking 12 gigalitres a year from it, all of which goes into the river anyway from the rain that falls within Canberra so we're not stealing anything from NSW.

Using that water, which will have new potable requirements placed on it, will probably, if the government agrees, require the public health authorities to implement something not done anywhere else in Australia – use UV rays at the end of the process to kill any remaining pathogens. We have extremely high quality water. We are spending a lot of money in the catchments to improve the quality of run-off. We're also going to spend a lot more money - \$60 million over the next four years - at the other end, the lower Molonglo end, to upgrade the quality of the water treatment at the lower Molonglo treatment centre to ensure that there are no disasters there.

It's an expensive business this, and in the end water will cost more. But that's the price of living in inland city and having high quality water. I think we are doing things reasonably well at the moment. But please, one request, please pray for rain. Even if you don't believe in God, he might be there.

Ms Anne O'Donnell

Ms Anne O'Donnell is the Chief Executive of Australian Ethical Investment Ltd. (AEI), a position she has held since October 2000. AEI is a Canberra based independent boutique fund manager specializing in 'ethical' investment. Ms O'Donnell is also a Director of the Center for Australian Ethical Research Pty Ltd and Community CPS Australia Ltd. Ms O'Donnell has some 23 years experience in the finance industry. Prior to joining AEI she held a senior management position with the ANZ Bank. During her time at ANZ Ms O'Donnell held a position as a staff elected trustee of the ANZ Staff Superannuation Fund. She is a Fellow of both the Australian Institute of Company Directors and FINSIA.

I often think Australian Ethical is one of Canberra's best kept secrets. We are a boutique fund manager. A boutique fund manager by definition has less than a billion dollars funds under management. We have around \$450 million give or take.

There are several things that make us unique in the boutique space, other than the fact we are in Canberra. Firstly we get a lot of our business direct from retail clients. We run a call centre and we do the majority of our operations in-house. Secondly we operate on both a negative and positive screen. I'm sure you have heard of negatively screened funds, but we are the only managers who run a positive screen as well.

Our business is making money. You give us your money to invest, we will guarantee to do that under our charter and we will provide you with a rate of return and we will charge you a fee to do that. That is basically how it works.

We have four public trusts and a public offer super fund. Now I won't bore you with this too much, this is just a bit of company history. We are in our 20th year of operations. The company was established in Sydney in 1986, and the company mythology has it that to stop the company from going completely broke, some of the Canberra-based directors drove to Sydney in a truck, collected all the records and came back, and took up one office at the CREEDA Business centre. We are still there, but not for much longer I hope.

It's been a very long haul, 11 years to make a maiden profit; first profit was made in 1997. In those early days the company was held together by founding directors who worked on a part-time basis and kept afloat by the generosity of our original investors and shareholders and family members of directors.

I joined the company in 2000; at that time we had eight staff and \$85 million dollars in funds under management. Today we are listed on the ASX. We have some 56 staff working in various places, the majority in Canberra, and we have some \$460 million dollars under management.

I think the very interesting thing about Australian Ethical is that our founding directors really did want to change the world. They were deeply committed to environmental and sustainable issues. In many ways, they were ahead of their time. They believed that money was a key driver to change behaviour and the way that money was invested could make a difference. You hear a lot about that today. I'm sure you have all heard about socially responsible investment, you hear about corporate responsibility, good governance and the impact of climate change, but in those early years when the company was first set up, they really were pioneers in the field. Ethical investment was considered really quite weird and most people dismissed it as a very odd concept.

In 2005 our balanced fund won the Standard and Poor's award for Best Balanced Fund Neutral. This was a great thrill because this was a mainstream award and we were there with all the other fund managers who had considered us quite an odd bunch for a very long time.

The key point of differentiation for us is our charter. It defines what we call our investable universe, so investments are 'in' or 'out' based on that charter. The other unusual thing is that it's actually embedded into the company constitution, we run the company in accord with the charter. Our positive screen ensures we are actively looking for companies that are doing good things. We do sometimes invest in companies that we refer to as neutral, that is they are not actually doing anything contrary to the charter, but they are not really doing anything that we consider especially good either, but we don't have a lot of those. We look for investments that are doing good generally.

The charter is quite broadly written but the practical impact is that we look for companies involved in activities such as recycling; the production of green energy and that encourage employee participation. Things that we avoid are: tobacco, alcohol, manufacturers of armaments, uranium mining and gambling.

We operate an employee share ownership scheme. Prior to the payment of a dividend the staff must be paid a bonus. The bonus can be up to 30% of the profit for the year. This year the bonus is \$5,500. Everybody in the company gets the same bonus, so I get the same bonus as the receptionist and that's very much part of the ethos of the company. You can take your bonus as shares, which is part of the process to encourage employee participation. We also have an options scheme as part of our employee share ownership scheme. Every year 5% of the issued capital of the company is issued to staff as options. The options are issued at 10% out of the money and are not exercisable for three years. The aim is to reward staff for company growth, to provide something of a golden handcuff and to again encourage ownership of the company.

The other thing we do that is unusual is that we have a tithe. Again before any profit is distributed via a dividend, 10% of the profit must be paid out to charitable and benevolent organisations. This year we will pay out \$170,000 to a number of charities. It's really given quite unconditionally. If you are a charitable or benevolent organisation you can list your name with us, we take a company-wide vote, and it's basically the people who get the top votes who will get the money.

We have a staff advocate who is elected by the staff, and they can sit in on certain sections of board meetings to represent the views of the staff. We produce an annual sustainability report; we are one of the few small organisations to do that. This is the 5th year we have produced that report and we produce it with guidelines established by the Global Reporting Initiative. This year we were honoured with the Best Continued High Quality Sustainable Reporting award from the Association of Chartered Accountants, which we were very pleased about.

For our purchasing policy, we employ the four R's – Reduce, Reuse, Recycle and Refuse. We also have a policy where we will pay up to 20% more for a sustainable product. We use recycled paper in the office, our newsletter is printed on recycled paper using vegetable-based inks. The newsletter is printed twice a year and it goes out to 35,000 people. We do a lot of recycling and composting in the company; it's really very embedded into what we do and who we are.

We have purchased a block at Trevor Pearcey House. We moved into the Capital Region Enterprise and Employment Development Association (CREEDA) in 1991. It's been a great for us to build the company but only take space as we need it. This certainly assisted in making our business sustainable and profitable.

We are very excited about Trevor Pearcey House. We are doing a green refurbishment on our 1000 square metres. We are installing passive heating and cooling and energy efficient lighting; there will be lots of natural light, additional insulation, double glazed windows and we are recycling many of the existing fittings. As I said, we are very excited about our premises. We are hoping that we will get a five star green rating on that building. This will make it unusual, as a lot of buildings with that rating are new buildings that are built specifically to get those ratings.

In terms of our investments, we run four public offer trusts and a public offer super fund. Each of our trusts has a different risk return profile.

As I mentioned before, the charter, the negative and the positive screens, determine what stocks we will invest in. Stock selection involves ethical researchers reviewing possible stocks. We may want to be in a particular area. For example, we wanted to get into bicycles, and it's actually quite hard to find listed bicycle manufacturers in the world. There's Shimano - Japan, and Accell in the Netherlands, and we hold investments in both of those. So we would say to our financial analysts, 'find some bicycle companies. They would try to find these companies; they would then go to ethical researchers who would look at them in terms of the screen and make sure they weren't doing business in a negative way, such as using child labour or something else that was not acceptable to us. Then the company goes back to a financial analyst who does the normal mainstream things, just trying to work out if it's good value, if it has good potential.

We use a disciplined buy/sell process, so this should ensure that we buy low and sell high and our modeling indicates that most of the time we get this right.

Following are some examples of what we call approved investments. At any time we could be in or out of these stocks, but they are on the list of approved investments. Some I'm sure you'll know: Ansell, Blackmores, Brambles, Cochlear (a stock we have been in for a long time and it's done very well for us), ResMed (which produces equipment to assist people with sleep apnoea), Gasnet and St George Bank.

We tend to be overweight in healthcare and underweight in utilities. However, you will note there are no mining stocks there. In terms of international stocks examples of approved limits are: Adobe, Boulder Electric, Genesis and Wyoming, Shimano, Tomra and Vestas. For all the companies that we invest in, you'll find a profile of them on our websites. That's something else unique about us, we will actually tell you why we think a company fits within our ethical charter. We won't make any comment about the financial side of it, because we will move in and out of those companies but we will detail why we think they are good ethical investments.

We have investments other than listed equity. We have property investments both in listed property vehicles and unlisted, and actually physically own some property.

We have a loan portfolio which is held mainly in our income trust. The majority of these loans would be to schools or alternate kinds of education and we would like to grow that portfolio. So if you know any schools that would like to borrow some money we would love to talk to them.

I might have made it sound easy but interpreting the charter in respect to a particular stock can at times be quite difficult. There's often quite a lot of robust debate about whether companies do meet the requirements of the charter. Certainly not all investors or our shareholders agree with every company that we invest in. We encourage our investors to ring us up and tell us why they think we shouldn't be in something, all those calls are noted. Our ethical researchers will take those comments on board and follow them up. We've had some good information from investors over the years and we are keen to get this sort of information.

One of our big problems is that we can invest in a company that is doing worthwhile things but that may also be involved in activities that we'd rather avoid. This tends to happen on mergers and acquisitions. We engage with those companies about why we prefer they were not doing it, what are they doing about it and what's their long-term strategy. Sometimes we divest, and sometimes we sway opinion, which is a really great thing to do.

At Australian Ethical we think we have built a sustainable business; we certainly think our trusts are focused on sustainable business. We've tried to find businesses that have good long term potential and have the ability to grow. We have a really loyal investor base - it's referred to in the industry as sticky money. Sticky money is money that comes to you for reasons other than straight returns and it tends to stay. But you still need to make a good return and since inception all our funds have had returns comparable to relevant benchmarks. As I said, we employ 58 staff and experience a very low turnover. We recently announced our profit for the 2005/06 year. It was another record profit, and it was an increase of 74% on the previous year, an amount of \$1.3 million. We're very pleased with that and we hope that we have many more years of growing our funds under management and influencing investment to come.

Dr Matthew Beaty

Dr Matthew Beaty is a research scientist with CSIRO Sustainable Ecosystems in Canberra. His research focuses on coupled social-ecological studies of urban areas and urbanising landscapes using a variety of research methodologies including spatial analytical approaches (e.g., geographic information systems, remote sensing, spatial metrics), field-based studies, social surveys and interviews, and case study narratives. His current projects are based in Sydney, Melbourne, Canberra, and California in the USA. Dr Beaty presented the talk on behalf of and in association with Mr Guy Barnett and Mr Allen Kearns, both from the Urban Systems Program, CSIRO Sustainable Ecosystems, Canberra

Today, I am going to talk about our emerging portfolio of research focused on understanding relationships between the urban environment and human health. I think you will find that this is a topic that has great relevance for the ways we design and plan our cities to maximise human health and well being while meeting environmental sustainability challenges. This research is just one part of a larger portfolio of work focused on Australian cities, and tomorrow there is another session on urban sustainability organised by CSIRO.

Today, I will talk about four main topics, beginning with some background on “*urbanisation, sustainability, and health.*” I will then move on to describe how CSIRO is approaching urban problems particularly in the context of urban sustainability and health. Then I’d like to provide a couple of snapshots of ongoing work. I will finish with some comments on why Canberra is a great place for undertaking urban sustainability research and our future research plans here.

Some of you may have seen this image before. It shows the lights of the world’s cities at night as captured by satellite. The reason for putting this up is to emphasise a couple of points:

- The first is that almost half the world’s population of 6 billion people now live in cities. The highly urbanised areas of the US, Europe, Japan and parts of Asia – and their night lights - show up particularly clearly here. While Australia appears quite dark, we are also highly urban with over 80% of our population living in cities and most within 50 km of the coast.
- The second point is that this urbanisation trend is set to continue with virtually all the world’s future population growth to take place in cities, mostly in the developing countries of Africa and Asia.

So what we can take home from this picture is that urbanisation is a major driving force in global change. But what does this mean for sustainability? Well as we all know, cities exert pressures on the environment well beyond their city boundaries. These pressures relate to the supply and demand of urban goods and services such as food, water, energy, land and transport. But it is not all bad news; cities also offer opportunities for sustainability. The very factors that currently make cities weigh so heavily on the environment – concentration of population and consumption – also give cities enormous economic, technical and intellectual leverage.

So we know that urbanisation can be both good and bad for sustainability, but what is the connection to human health? If we take a minute to think about historical perspectives on urban health we will see that the current challenges – and the ways of understanding them – are very different today than they were 100 years ago. This slide shows some health data for Baltimore, Maryland at the end of the 19th Century. Notice that the major causes of death are related to infectious diseases that are linked in many ways to high density and unsanitary urban conditions. These patterns are representative of many world cities at that time. In looking for causes of disease, health officials identified that conditions were worse in cities than in the countryside and some parts of the city were worse than others. However, there was not yet a systematic, scientific understanding of how the built environment influences human health. This cartoon pokes fun at the London Board of Health for being preoccupied with the Miasma, or foul vapours, that were thought to cause Cholera.

At this same time, there emerged new perspectives on environmental health represented here by Dr John Snow's work on cholera outbreaks in London. Snow famously mapped the incidences of cholera and identified that most cases were associated with the contaminated pump on Broad Street. He took the handle off the pump and cholera cases decreased. The following century saw many great advances in public health, civil engineering and environmental science that were successful in reducing the incidence of health problems through provision of clean water, the removal and treatment of wastewater and garbage, and the regulation of industrial wastes, effluents and emissions.

Twenty-first century public health problems are different than past problems. For example, returning to Baltimore, we can see that current causes of death are now related to heart disease, cancer, stroke, and diabetes – diseases that are linked to lifestyle choices we make. These new diseases of urban living arise more from the complex way we now live, eat, travel, build, play and work in urban environments, rather than from any single agency. In short, our individual health and well being is now strongly linked to the structure and quality of our built environment.

So what is CSIRO doing to address the complexity in researching sustainability and health? How do we avoid looking in the wrong places for solutions to emerging urban problems? I'd like to now talk about five ideas that we are incorporating into our research.

- Cities represent the intersection of a range of issues where ecological and social factors come together. However, traditional disciplinary boundaries have prevented the level of integration needed for understanding social-ecological systems like cities. We are now attempting to work across knowledge domains by assembling interdisciplinary research teams and linking with stakeholders in the community and industry. This approach also means confronting competing social and ecological values and navigating complex trade-offs between the two.
- Traditionally, ecologists have viewed people as being outside of ecological systems or as a negative agent of change. More recently, the desire for social and ecological integration has led to the incorporation of social processes. This, of course, has added a great deal of complexity especially when considering all of the possible interactions among parts of the system. This “urban ecosystem” perspective views the city as a distinct type of ecosystem characterised by the linkages between social and ecological processes and asks questions about the spatial, systems and social context of urban people and the extent of their impacts on their urban bioregion. For example, from where do urban people derive their water, energy and food, where do people spend most of their time, how far do they travel to work, school and recreational outlets and what social-ecological conditions contribute to their cultural identity, sense of place, health and well being?
- The next idea I would like to discuss centres around a renewed interest in understanding environmental determinants of health. If we recall John Snow’s cholera map, this approach was in many ways the beginning of the field of spatial epidemiology and the disease patterns Snow identified were largely related to an environmental factor – contaminated drinking water. Such an approach does not deal with the social context of disease and health, and this shortcoming has been addressed, particularly over the last 30 years, by an emphasis on social determinants of health. This diagram shows an ‘ecological’ model of health but in this case the emphasis is on the social environment and not the physical environment. Both of these approaches are appropriate for different questions.
- An emerging research effort is focused on blending the two approaches to consider both social and environmental determinants of health. This merger has largely been in the areas of emerging infectious disease, and we think there is great potential for embedding this view of health into the ecosystem framework I described earlier. Of course, this view increases the complexity we must consider, but it also suggests the potential for a range of solutions.

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- One way of getting a handle on the complexity of social-ecological systems and of finding solutions that can be implemented, is to take a spatial view of urban sustainability and health. We can use Geographic Information Systems to combine a range of social and ecological datasets that we can then interrogate to answer specific questions. As a simple example, we can combine and overlay land cover datasets (such as satellite imagery, greenspace mapping, lot sizes, road networks), with social data (such as census data) and link health outcomes data to generate spatially explicit hypotheses about the underlying causes of positive or negative health outcomes.
 - The final area where our science is heading is in re-focusing the scale at which we address the issue of sustainability. At present we see a focus at the “whole-of-city” scale, where State of Environment reports and other sustainability reporting are used. At the other end of the spectrum, we often focus on sustainability at the household level. Either through physical changes to our home and gardens or through behavioural change. For example, to reduce energy consumption people might install insulation, a solar hot water heater, or low energy light bulbs. What is often missing in ecological and sustainability research is a focus on neighbourhoods and in turn how neighbourhoods are linked to the broader urban landscape. There is much planning that occurs at the neighbourhood scale but less attention is paid to how neighbourhoods are situated within their urban contexts. This is also a scale at which citywide and local actions intersect and where bottom-up and top-down solutions to urban sustainability can be evaluated and refined.

I'd like to end this section of the talk by mentioning some of the urban sustainability indicators (and key research questions) that could emerge from the perspectives I have just described. These are areas that I think are important for making the transition towards healthier cities:

- *The spatial and temporal dynamics of social and environmental determinants of human health in urban systems;* (What is the spatial epidemiology of who gets sick and where do they live? What types of interventions are available and appropriate?)
- *Measures of health and well being in different urban forms;* (Can we identify the characteristics of dysfunctional and functional urban landscapes and incorporate this knowledge into better urban planning, design, construction and management?)
- *Urban resilience to shocks and disturbances caused by natural and human disasters;* (Can we identify aspects of our social, natural and built environment that make us vulnerable to natural and human disasters?)
- *Maintenance of ecosystem services and food production in urban environments;* (How important is it to conserve natural systems and sustain agricultural lands for healthy local food production?)

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- *Measures of urban quality of life that address the effects of surplus consumption;* (What educational changes, and access to information and knowledge, is necessary to raise awareness about the individual health and well being consequences of surplus consumption; particularly of food, but also of energy, water and construction materials?)
 - Finally, to have any significant impact on the health and well being of people in urban environments, urban society will require the integration of new urban science knowledge into urban planning, design and construction of healthier homes, workplaces, community centres, recreation areas, mobility and transport infrastructure.

I would like to briefly describe the focus of our Canberra based research group. Our work aims to link neighbourhoods to landscapes and complements other work at CSIRO focused at the building scale and whole of city scale. We are also trying to work across a wide range of knowledge domains (e.g., landscape ecology, plant ecology, social science, medical geography, geography). Overall, a unifying goal of this research is to understand the linkages between neighbourhoods and the broader urban landscape and the ways that humans interact with urban environments both as drivers of change and through environmental influences on human health and wellbeing. So the focus of this work is ultimately on how cities function as complex social-ecological systems and how this view of the city can help us understand complex tradeoffs between social and environmental concerns.

To this end we utilise a range of approaches ranging from quantitative analysis of spatial data to qualitative analysis of interviews and case study narratives. The goal here is to take a broad view of urban science and use a range of tools to untangle some of the complexity I described before.

One area we are focusing on is the linkage between urban greenspace and human health, and we currently have projects in Melbourne, Sydney, and Canberra. I will now briefly provide some snapshots of the work in Melbourne and Sydney.

We began our work in Melbourne by asking a basic question about the relationship between people and environment – do healthy environments lead to healthy people? This research focused on identifying pattern of greenspace using high resolution satellite imagery and then compared the results to available and commonly used health outcomes data. We were successful at detecting the range of urban greenspace, but we found no relationship between greenspace and health outcomes data. We suspect this was primarily related to a mismatch in spatial scales and highlights shortcomings in the availability of health datasets which are aggregated to coarse scales to preserve confidentiality. Our current projects are addressing this shortcoming either by collecting our own detailed health data or by linking with health professionals to access health outcomes data.

In Sydney, we are working to understand how patterns of human physical activity vary across ecological and social gradients in the city. In this satellite image of Sydney we can see a diversity of spatial patterns in the built environment. There is also a great deal of social diversity as well. In this project we are linking this landscape scale view to individual neighbourhoods. This includes collecting local neighbourhood data on ecological and household characteristics, as well as, patterns of human physical activity through a health survey. There are several components to this work but ultimately we hope to understand the role of neighbourhood versus citywide factors in human physical activity, and this could help us understand the range of interventions available and the scale at which they would be most effective.

So to conclude, I just wanted to make a couple of points about our research plan for Canberra. I'd like to do this by addressing a few questions:

Why Canberra as a focus for urban sustainability research?

- Firstly, it is one of the few planned cities in the world, providing us with a fabulous opportunity to compare urban planning intent with what actually happened – urban planning outcomes!
- It is a medium-sized city with a well documented history. This helps us when we are trying to unravel urban complexities and makes it a little easier than working in Sydney or Melbourne.
- So the idea is to use Canberra to demonstrate 'proof-of concept' of these research ideas for application elsewhere in Australia and internationally. Thus we are hoping that Canberra can be a model for urban sustainability research internationally.
- It has a diverse population – highly educated and affluent but not without complex social problems
- Research partnerships with government, universities and industry are emerging that will help facilitate these goals.

Why the research capacity we have here in Canberra is unique?

- Within CSIRO we have a multidisciplinary team with expertise in environmental and social science. CSIRO is also linked to government and university researchers (e.g., ACT Health, ANU-NCEPH, UNSW@ADFA). Given that this is where we live, there is a lot of local knowledge about Canberra that can help inform our research.

What research is currently underway by CSIRO in Canberra?

- We have also just initiated three projects based in Canberra and we hope that they are the beginning of a long-term engagement. The projects include:
 1. Measuring and monitoring urban ecological function
 2. Community monitoring of the urban bush-land interface

These two projects are funded by the ACT Government and the Department of Environment and Heritage.

3. Risk and resilience of children to obesity in urban neighborhoods


This project is funded through an innovation grant within CSIRO Sustainable Ecosystems and represents the Division's commitment to this important emerging science area.

I will end here. Please feel free to contact me for follow-up or clarification of the ideas presented today.

Acknowledgements: We wish to acknowledge the support of the CSIRO Sustainable Ecosystems Division, the Sydney Olympic Park Authority, the University of Melbourne, and the University of New South Wales for financial and in-kind support for our work in Melbourne and Sydney.

Appendix 1


Dr Paul Dugdale slides from presentation



Sustainable, healthy development of a global village


Dr Paul Dugdale
ACT Chief Health Officer

ACT Focus on Business Conference
13 September 2006
Hyatt Hotel Canberra



Sustainable, healthy development of a global village



- The policy context: Canberra's commitment to sustainable, healthy development
- The ethical context: Why do we want sustainable, healthy development ?
- The scientific context: What does sustainable healthy development look like?



ACT Economic White Paper

"A strong and productive economy must build upon and be supported by a healthy environment and a healthy society"



ACT Government Economic White Paper



Canberra Spatial Plan



- The liveable city, enjoyed by all
- An international city with a dynamic heart
- A city of choice
- Where the natural and cultural environment is respected and protected
- Create and maintain a healthy community

Canberra Spatial Plan



Canberra Social Plan


- Invest in children and young people
- Meet the health needs of an ageing population
- Focus on prevention and early intervention
- Develop sustainable social care supports
- Support an active lifestyle at all stages of people's lives




The Ethical Context

- Why should we care and what should we do?
- "Humans are collectively overloading Earth's capacity to supply, absorb, replenish and stabilise, and this poses a profound, potentially irreversible, form of non-sustainability"


A.J. McMichael, ANU Eu. J. Pub. Health




 ACT Health


Health as the bottom line


- Should we aim to preserve the environment at the expense of human well-being?
- Not in the big picture: we need to understand population health as the long term bottom line.



 ACT Health

- ‘Ecological sustainability’ is not just about maintaining flows from the natural world that sustain the economic engine nor maintaining iconic species and iconic ecosystems. It is about maintaining the complex systems that support health and life. Population well-being and health, understood thus, become the real bottom line of sustainability’ McMichael





 ACT Health

The scientific context


- The world population, currently 6 billion, will plateau at 9 billion in 2070 then decline
- World GNP will increase four fold.
- Fossil fuel (coal) will not run out for over 200yrs.


Jeffrey Sachs, I.J. Development Issues



 ACT Health

- The world urban population has grown from 2.3b in 1990 to 3.0b in 2003
- Australia’s urban population has grown from 14.5m in 1990 to 18.3m in 2003
(World Bank 2005 world development indicators)
- Urbanisation is THE current trend of humanity.
- Sustainable, healthy urban development is THE issue





 ACT Health

The urban penalty

- Urbanisation confronts human populations with the ‘urban penalty’: infectious disease, depression, obesity and climate change


McMichael, Fenner Conference, Canberra 2006



 ACT Health

- ‘The problem is not that cities have problems – a city without problems would have no people living in it – but that the problem-solving strategies have broken down. There is not so much a shortage of investment as there is a shortage of imagination’


ACT Economic White Paper



ACT Health

The urban solution

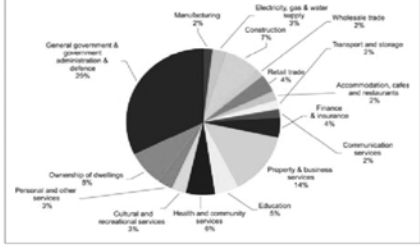
- Canberra exudes an imaginative approach to sustainable, healthy development.
- In the spirit of the healthy cities movement, all sectors of the community can contribute to public health.
- Today we are focussing on the infrastructure, property and finance sectors



ACT Health


Public Health and the ACT Economy

Figure 2. ACT Gross State Product by industry



Industry	Percentage
General government & government administration & defence	20%
Property & business services	14%
Health and community services	9%
Education	5%
Manufacturing	4%
Retail trade	4%
Finance & insurance	4%
Wholesale trade	2%
Transport and storage	2%
Accommodation, cafes and restaurants	2%
Communication services	2%
Electricity, gas & water supply	2%
Construction	2%
Ownership of dwellings	2%
Personal and other services	2%
Cultural and recreational services	2%


Source: ABS Australian National Accounts, State Accounts, 2001-02 (Cat#4694 No. 1020-3)



ACT Health

Canberra: a global village


- Water infrastructure should minimise infectious disease risk (from drinking water and sewerage and runoff management) and minimise our ecological footprint by maximising recycling to our river system, preferably cleaner out than in.
- Other infrastructure should creatively address greenhouse emissions.



ACT Health

Canberra: a global village


- Urban development should increase the footprints on the ground by encouraging physical activity, and contribute to quality of life through a culture of inclusion and zest.
- Increases in GNP through knowledge, culture and services draws on and supports the world's growing human population.



ACT Health

Canberra: a global village


- A wealthy city should lead the way and reach out to the world. We should export ethical investment in sustainable, healthy development.
- A thoughtful city should research how to improve urbanisation. We should strive to understand our city, its sustainability and its population's health.



ACT Health


Canberra: a global village

- The ACT has Australia's lowest rate of obesity. We also have the highest rate of Malaria, because our population is the most internationally travelled.
- We've seen the world.
- Now its time to show the world our leadership in the sustainable, healthy development of livable cities.



Appendix 2

Ms Anne O'Donnell slides from presentation

 Australian Ethical
Investment + Superannuation

INTRODUCTION

- AEI is a boutique fund manager.
- Our investment universe is dictated by our Ethical Charter.
- Four unit trusts.
- Public offer superannuation fund.
- Generate our income from management fees and entry fees.

 Australian Ethical
Investment + Superannuation

CORPORATE HISTORY


1986 The company was formed by a group of individuals who wished to promote ethical investments. It grew out of a private investment company, August Investments Pty Ltd. formed in 1981.

1989 Public prospectus for Australian Ethical Balanced Trust issued.

1991 Business moved from Sydney to CREEDA Business Centre, Canberra.

1994 The Company changed its name to Australian Ethical Investment Limited. In November 1994, a second Trust, the Australian Ethical Equities Trust, was launched.

1997 The Company made its maiden trading profit. Two new trusts, the Australian Ethical Income Trust and the Australian Ethical Large Companies Share Trust, were launched.

 Australian Ethical
Investment + Superannuation

CORPORATE HISTORY (Cont'd)

1998 In November 1998, the Australian Ethical Superannuation Fund was launched.

2002 Australian Ethical was floated as a listed company on the Australian Stock Exchange.

2004 AEI was granted an Australian Financial Services licence in January 2004.


2005 AEI Balanced Trust – the winner of the Standard & Poor's Balanced Trust - Neutral Award.

2006 Funds Under Management (FUM) \$457 million.

 Australian Ethical
Investment + Superannuation

AUSTRALIAN ETHICAL'S VISION

By its operations Australian Ethical will promote a sea-change in community-wide practice such that all investment will be undertaken with an ethical purpose as well as in pursuit of competitive return for chosen risk.

 Australian Ethical
Investment + Superannuation

AUSTRALIAN ETHICAL CHARTER


- Key point of differentiation for AEI.
- Defines our investment universe.
- Forms part of the Company Constitution.

 Australian Ethical
Investment + Superannuation

The Australian Ethical Charter

The Trusts shall seek out investments which provide for and support:

- the development of workers' participation in the ownership and control of their work organisations and places;
- the production of high quality and properly presented products and services;
- the development of locally based ventures;
- the development of appropriate technological systems;
- the amelioration of wasteful or polluting practices;
- the development of sustainable land use and food production;

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Investment + Superannuation

The Australian Ethical Charter (Cont'd)

- the preservation of endangered eco-systems;
- activities which contribute to human happiness, dignity and education;
- the dignity and well being of non-human animals;
- the efficient use of human waste;
- the alleviation of poverty in all its forms;
- the development and preservation of appropriate human buildings and landscapes.

 **Australian Ethical**
Investment + Superannuation

The Australian Ethical Charter (Cont'd)


The Trusts shall avoid any investment which is considered to unnecessarily:

- pollute land, air or water;
- destroy or waste non-recurring resources;
- extract, create, produce, manufacture or market materials, products, goods or services which have a harmful effect on humans, non-human animals or the environment;
- market, promote or advertise, products or services in a misleading or deceitful manner;
- create markets by the promotion or advertising of unwanted products or services;

 **Australian Ethical**
Investment + Superannuation


The Australian Ethical Charter (Cont'd)

- acquire land or commodities primarily for the purpose of speculative gain;
- create, encourage or perpetuate militarism or engage in the manufacture of armaments;
- entice people into financial over-commitment;
- exploit people through the payment of low wages or the provision of poor working conditions;
- discriminate by way of race, religion or sex in employment, marketing or advertising practices;
- contribute to the inhibition of human rights generally.

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Investment + Superannuation


COMPANY BUSINESS

- Employee Share Ownership Scheme.
- Tithe.
- Staff Advocate.
- Sustainability Committee.
- Annual Sustainability Report.
- Purchasing Policy – 4 R's
Reduce, Reuse, Recycle and Refuse.

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Investment + Superannuation

PREMISES

- Purchase Block E at Trevor Pearcey House, Bruce.
- Green refurbishment on building.
- Goal is a 5 star green rating.

 **Australian Ethical**
Investment + Superannuation

CHARTER & INVESTMENTS

- Australian Ethical Balanced Trust.
- Australian Ethical Equities Trust.
- Australian Ethical Income Trust.
- Australian Ethical Large Companies Share Trust.
- Australian Ethical Superannuation Fund.

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CHARTER & INVESTMENTS (Cont'd)

- Charter determines our investment universe.
- Ethical Research and Financial Research.
- Companies involved in sustainable industries and those doing good things have the best long term prospects.

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EXAMPLES OF APPROVED INVESTMENTS

EQUITY:

Listed Australia

- Ansell
- Blackmores
- Brambles Industries Plc.
- Cochlear Ltd.
- Resmed
- Gasnet
- St George Bank

 Australian Ethical
Investment + Superannuation

EXAMPLES OF APPROVED INVESTMENTS (Cont'd)

EQUITY:


Listed International

- Adobe Systems Inc.
- Balder Electric
- Genesee & Wyoming Inc.
- Shimano Inc.
- Tomra Systems ASA.
- Vestas Wind Systems
- Whole Foods Market

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EXAMPLES OF APPROVED INVESTMENTS (Cont'd)

- **Property**
- **Fixed Interest**
- **Loans**

 Australian Ethical
Investment + Superannuation

BUSINESS OUTCOMES


- AEI has a market capitalisation of \$25 million.
- Funds Under Management (FUM) \$460m.
- Loyal Investor Base "Sticky Money".
- Since inception all funds have returns comparable to relevant benchmarks.
- Employ 58 staff, experience low staff turnover.

 Australian Ethical
Investment + Superannuation

www.austethical.com.au

Appendix 3

Dr Matthew Beaty slides from presentation



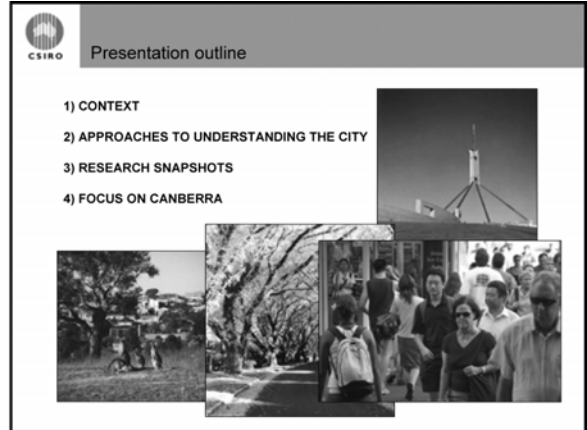
CSIRO Sustainability and health in our cities

Matthew Beaty, Guy Barnett, and Allen Kearns
Urban Systems Program
CSIRO Sustainable Ecosystems, Canberra

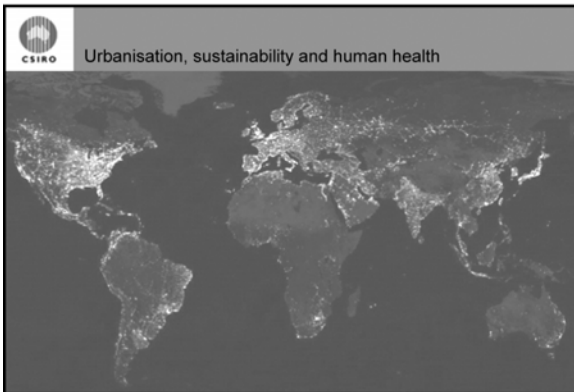
Sustainable Healthy Development - the ACT Way
Canberra and Region Focus on Business, 13 September 2006

CSIRO Presentation outline

- 1) CONTEXT
- 2) APPROACHES TO UNDERSTANDING THE CITY
- 3) RESEARCH SNAPSHOTS
- 4) FOCUS ON CANBERRA

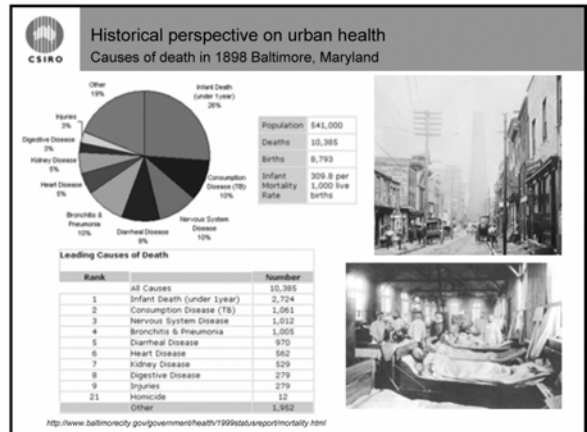


CSIRO Urbanisation, sustainability and human health



<http://antwrp.gsfc.nasa.gov/apod/astropix.html>

CSIRO Historical perspective on urban health
Causes of death in 1898 Baltimore, Maryland



Population: 541,000
Deaths: 10,385
Births: 8,793
Infant Mortality Rate: 309.8 per 1,000 live births

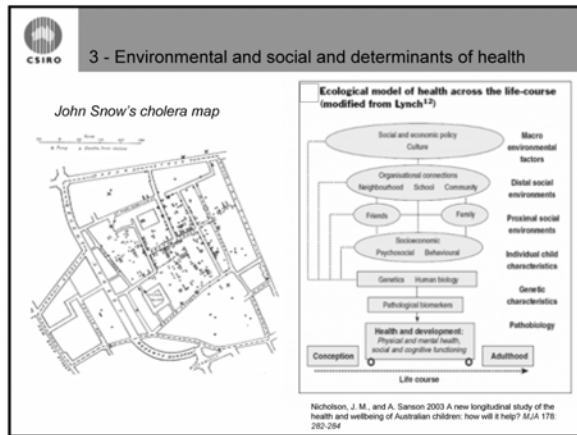
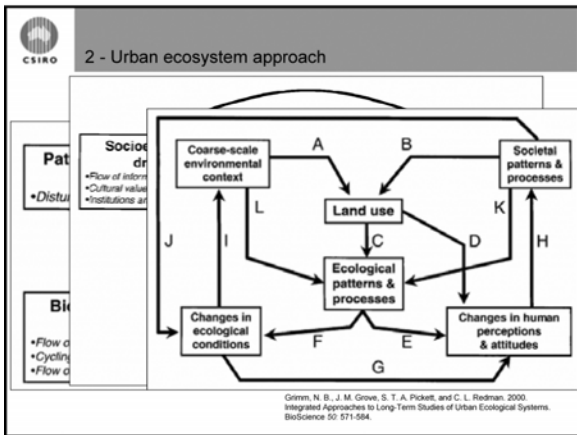
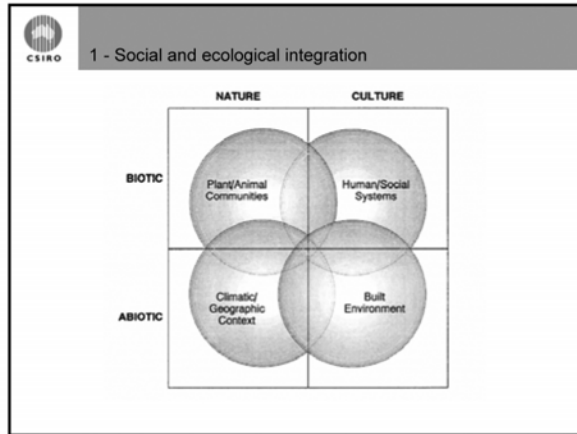
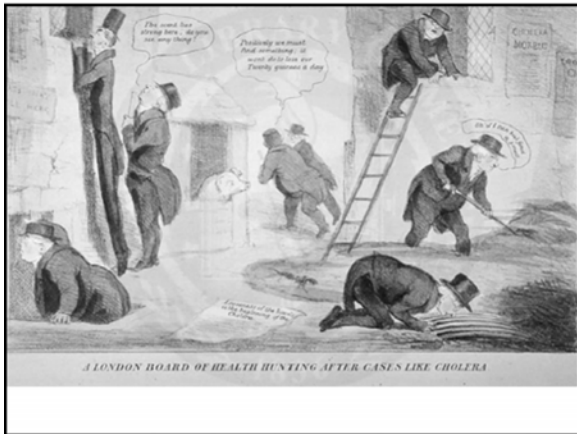
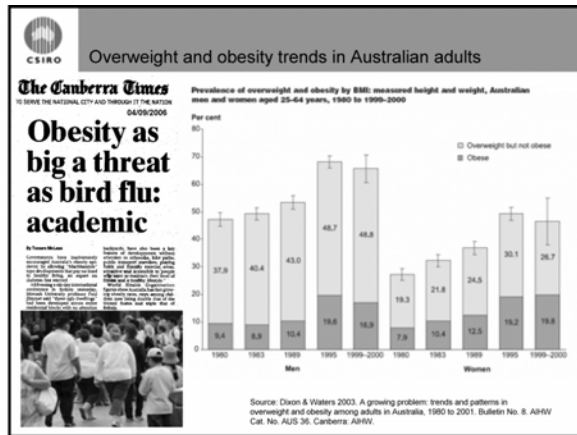
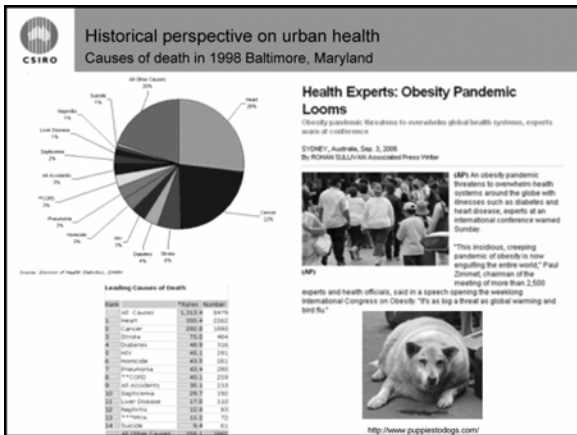
Rank	Number
1	All Causes 10,385
2	Infant Death (under 1 year) 2,724
3	Consumption Disease (TB) 1,061
4	Nervous System Disease 1,012
5	Bronchitis & Pneumonia 1,005
6	Diarrheal Disease 970
7	Heart Disease 562
8	Kidney Disease 529
9	Digestive Disease 279
10	Injuries 279
11	Homicide 12
12	Other 1,952

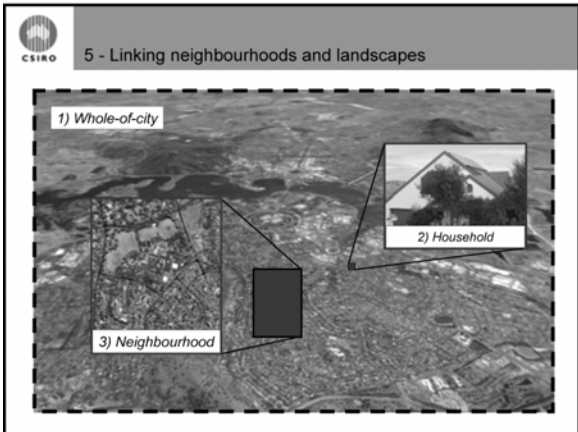
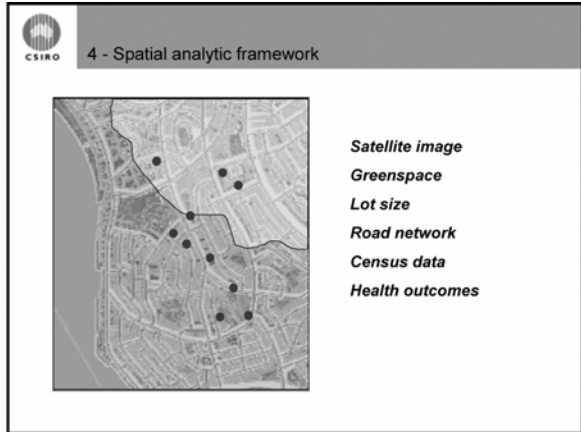
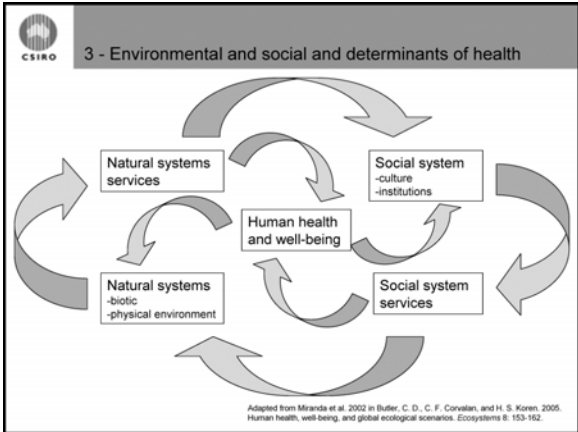
<http://www.baltimorecity.gov/government/health/1999statusreport/mortality.html>



CSIRO Historical perspective on urban health
Cholera in London 1854







Research areas

Urban Landscape Ecology

- Linkages between urban spatial patterns and ecological and social processes
- Urbanisation trajectories (LULC)

Urban Ecological Function

- Cities as complex ecosystems
- Urban natural resource management

Environment and Human Health

- Greenspace, the built environment, and health
- Lifestyle and infectious disease
- Vulnerable populations (e.g., children)

Vulnerability and Resilience

- Bushfire vulnerability at the urban-wild land interface
- Urban resilience in the face of global environmental change and terrorism

Approaches

Study sites in Melbourne – Sydney – Canberra

Spatial and temporal analysis

- Social and ecological data integration
- Remote sensing
- Spatial modelling

Field based studies

- Environmental sampling and monitoring
- Biodiversity (flora and avifauna)

Spatial epidemiology

- Health surveys (e.g., physical activity, lifestyle choices)
- Linked ecological and epidemiological framework

Narratives about cities

Urban greenspace and human health


Do greener cities mean healthier people?
 How do we measure the effect and value of urban green space on our health? The possibilities are vast, and this research project is attempting to quantify and help to direct the planning of better cities.

What benefits do people derive from contact with nature?

How can these benefits be optimised through urban design?


What health hazards may result from not having greenspace?

Can we reduce health hazards by expanding urban greenspace?



Healthy environments, healthy people?

Example: Maribyrnong LGA



Layer:	Greenspace	Socio-economic	Population Health
Scale:	2.5 m pixels	Census CDs	LGAs
Source:	QuickBird 2001	ABS SEIFA 2001	Vic BoD Studies
Measure:	NDVI	Index Adv-Disadv.	DALYs/1000 pop.
Status:	Good	Poor	Poor

Human health across ecological and social gradients in Sydney
 Landscape to neighbourhood scales



Human health across ecological and social gradients in Sydney
 Physical activity survey

Part 1: Sociodemographics

- Gender, Age, Marital Status, Housing Tenure, Place of Birth, etc.

Part 2: Estimated physical activity

- IPAQ physical activity questionnaire

Part 3: Perceived physical environment

- Safety (crime, infrastructure), Traffic, Weather, Aesthetic, Vegetation and Bird Diversity

Part 4: Perceived social environment

- Social diversity, Activity of neighbours, family and friends

Part 5: Neighbourhood vs. regional physical activity attractors


- What do you consider your neighbourhood, Nearby parks / open spaces, ease of walking / cycling in neighbourhood, knowledge of and visitation to regional attractors

Research plan for Canberra

Why Canberra as a focus for urban sustainability research?

Why the research capacity we have here in Canberra is unique?

What research is currently underway by CSIRO in Canberra?



For more information...

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Acknowledgements...

Thank you to Paul Dugdale and the conference organisers for the opportunity to present here today. Much of the work presented reflects the ideas of Allen Keirns, Melinda Spink and Guy Barnett at CSIRO and a collaboration with Dr Amy Griffin at the University of New South Wales, ADFA Campus, on landscape and health.

Thank You

