



# WORLD TECHNOLOGY Benefits to New Zealand

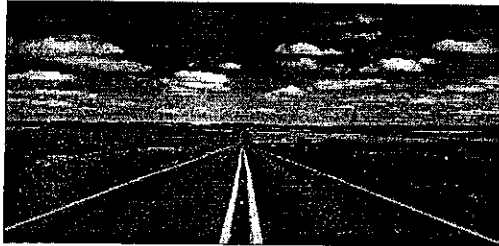
The Institute of Road Transport Engineers  
of New Zealand Conference

Thursday 16 July 1998, Old Wellington Town Hall, Wellington.



Hon Maurice Williamson

Minister of Transport  
Minister of Communications  
Minister for Information Technology



Good morning, and thank you for inviting me to open your conference and speak to the the theme "World Technology: Benefits to New Zealand."

## A Century of Change

- We have come a long way in just 100 years



New Zealand is facing change of a magnitude last felt during the industrial revolution. We are on the cusp of a knowledge revolution.

For New Zealand to succeed in this new global knowledge economy we need a few simple but vital ingredients:

We need a more highly-skilled, science and technology literate workforce – below the neck will be minimum wage.

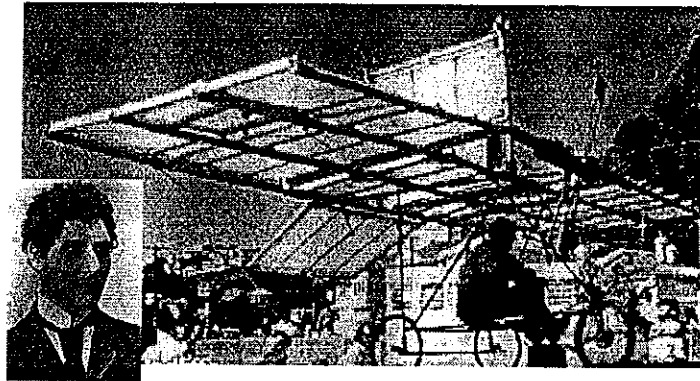
We need to keep ahead of the game with research and development. In the future, if you aren't world class and number one you better move on to something else. Staying ahead and staying flexible relies on knowing more than your competitors, and being able to use that knowledge quickly.

A big part of using knowledge effectively is good information and communications technology. There will be mind-blowing growth in capability, with individuals and firms able to be globally interconnected with high-quality video and audio anywhere anytime.

But having a highly skilled workforce, plenty of research and development, and brilliant information technology won't do us any good without the last ingredient – the right mind-set. We have to start celebrating success in business, in science and technology, in education and the arts as well as in sport. We need to reinvigorate a national spirit that is daring, entrepreneurial and totally confident. These are the keys to a successful future.

**(click)** Lets take a look at some of the changes and advances that have taken place over the last century and how these have impacted on our lives.

## 1903 - First Powered Flight



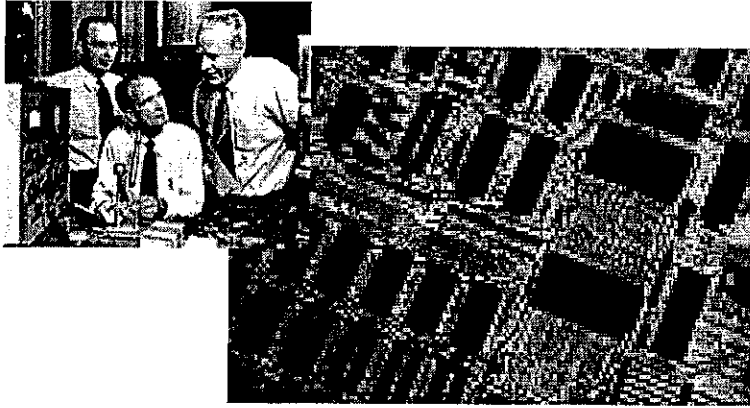
Richard William Pearse first flew his aircraft between 1902-1903 in the farming settlement of Waitohi, in the South Island of New Zealand. Although the exact date of his first flight is not known, it is almost certain that it took place before the Wright brother's more famous flight.

His achievements were even more remarkable because unlike the Wright Brothers who employed skilled engineers and who later enjoyed the luxury of US Government sponsorship, Pearse designed, financed, and built everything himself. And he did not even have access to a university or library, but gained his knowledge solely through reading magazines.

The ability to fly has changed the nature of the world - it is now a much smaller, more accessible place.

It used to take six weeks to travel by ship from Britain to New Zealand, now that same trip can be made in a day!

## 1947 - The Transistor Invented

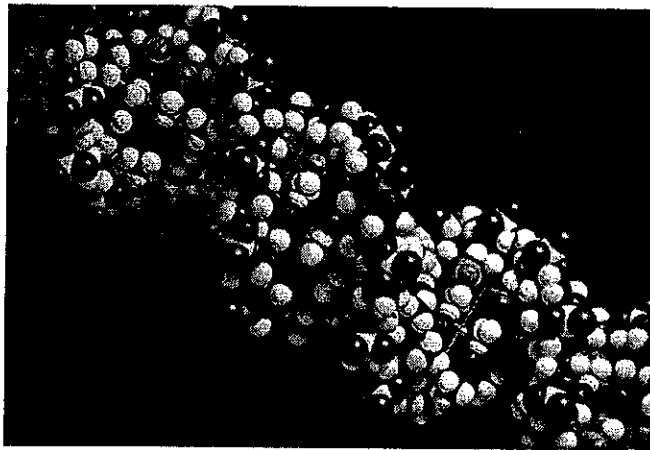


In 1947 a group of researchers at Bell Laboratories in the US invented the transistor.

This small device has had an enormous impact. The radio, for example, shifted from the shelf to the shirt pocket, making it a lifestyle product of a new generation.

The transistor also paved the way for the development of the integrated circuit, which in turn enabled the development of the microprocessor -the heart of the modern computer. An appliance that has perhaps more than any other changed the nature of society.

## 1953 - Structure of DNA Deciphered



The structure of DNA, one of the fundamental building blocks of life, was deciphered in 1953.

One of the latest areas of application for DNA-derived research is the development of a DNA-based computer.

Imagine a computer that is one hundred times faster than today's supercomputers; it has an energy consumption that is a billion times more efficient; and it has a storage capacity that is one trillion times denser than today's storage devices.

Parallel processing power through the use of biochemical reactions make such a computer possible.

Although not yet available, the concept has been proven and research in the area continues.

## 1969 - Man Lands on the Moon



In 1969 the first man landed on the moon.

As well as the direct insights into the origins of our earth and the solar system that this and subsequent missions have provided, there are virtually thousands of innovative products that have resulted from the science and technology of space travel.

These innovations range from fogless ski goggles to a programmable pacemaker that can be fine tuned to suit a heart patient's changing needs.

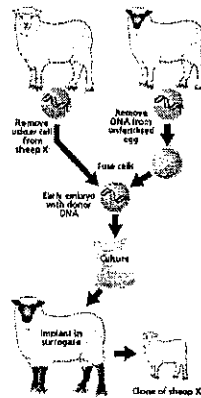
## 1978 - First Test-tube Baby



In 1978 the world's first test-tube baby was born. This was made possible as a direct result of research in the field of invitro-fertilisation.

This technology offers thousands of couples who would have not had the opportunity the chance to have a child of their own .

## 1997 - Dolly the Sheep Cloned



Just last year the first animal was successfully cloned.

This cloning technology is challenging not only our scientific and technological boundaries but also our ethical boundaries.

Ethics in science are an extremely complicated issue. Ethics are not a static set of ideals, they evolve and change over time. They also vary according to cultural value.

This debate looks set to continue with the recent announcement by an American scientist that he plans to establish a clinic to clone humans.

From these examples it is clear that science and technology have played a fundamental role in shaping our past, and will continue to do so into the future.



## The Knowledge Revolution

- Need to prepare for a future in the global knowledge economy
- Profound change
- Explosive growth of digital networks



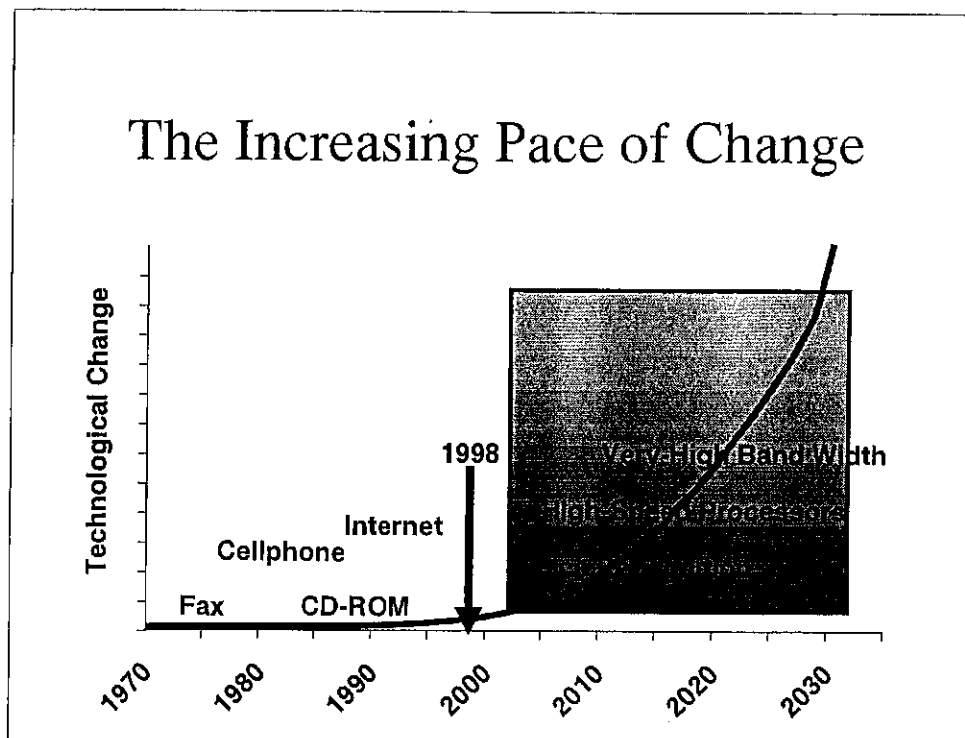
**(click)** We need to prepare New Zealand for a future in the global knowledge age. We are right at the beginning of a knowledge revolution that is going to totally change the shape of our society. In this new age, the ability to access, develop and apply knowledge will be the driver of productivity and growth.

**(click)** The knowledge revolution will be as profound for us as the Industrial revolution was to the 19th Century. It will change the nature of every organisation and every job.

A good analogy is the 1850's in England when the previous invention of the steam engine led, through a short burst of development, to a network of railway lines with London as the hub. This communication network brought England together into a closely networked economy and thus enabled the transition from the Agricultural to Industrial Age to accelerate. What was suddenly available was the rapid communication of information, passage of materials and goods, and mass movement of people.

**(click)** The analogy with today is the explosive growth of the Digital Network with all of its profound impacts on the communication of information, electronic commerce and the opportunity for global relationships between individuals and organisations.

Collaboration in other words



Let us look at another aspect of the knowledge revolution - the impact of communication technologies.

We can think of this as a classical exponential curve (**click**) with one technology feeding off the next to give an ever faster pace of change

- (**click**) faxes in the 1970's
- (**click**) cell phones in the 1980's
- (**click**) CD-ROMs, the (**click**) Internet and world-wide web technology within the last few years

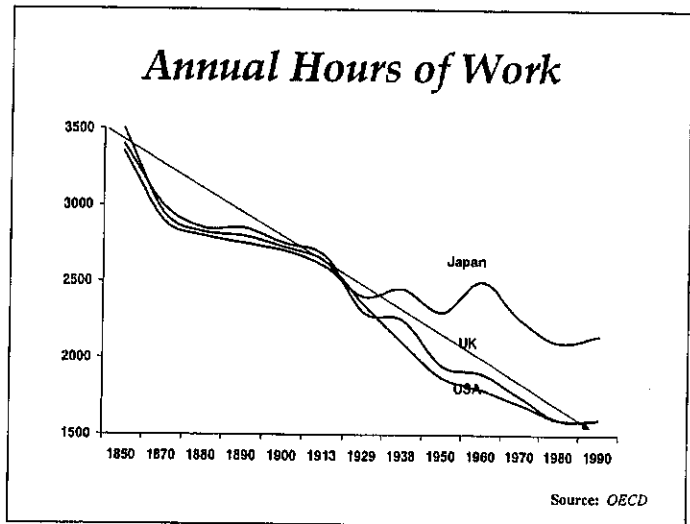
We can already look at this progression in technology and think of the immense impact it has had, and is likely to have, on our lives, on business and on society.

But we have barely started on the curve. (**click**) We are here in 1998. But what is going to come next?

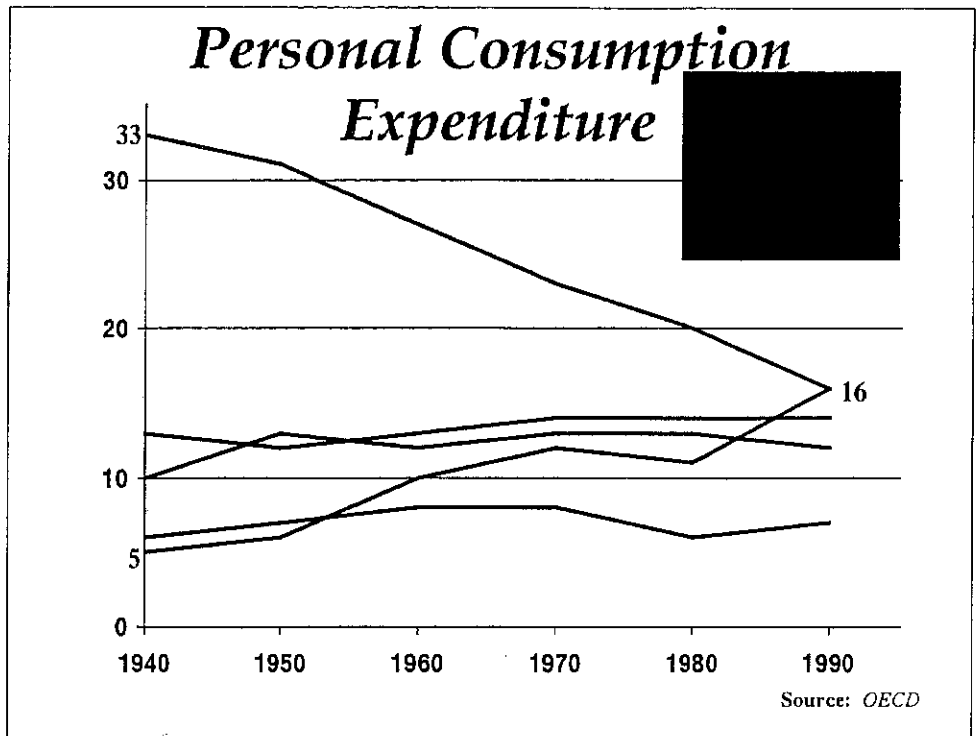
(**click**) What technologies will appear in here? What impacts will they have? Are they going to change game plans forever, and for quite unanticipated reasons?

MIT Media Labs, of the US, state that "80 per cent of the systems, processes, services and products that today's five-year olds will experience and use as adults have not yet been thought of."

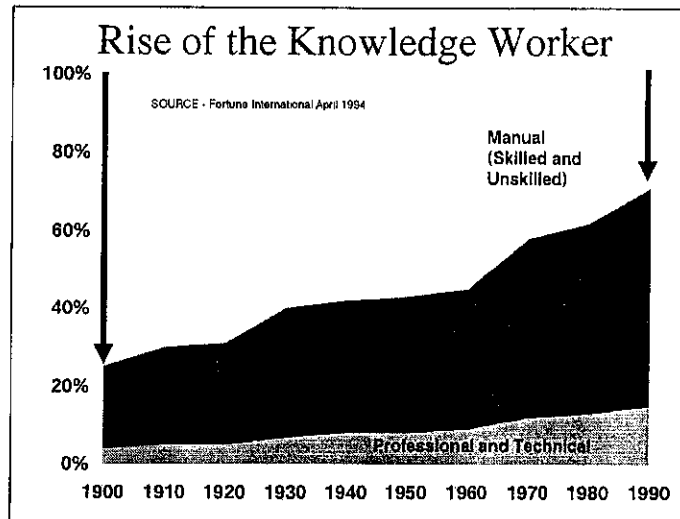
The ramifications for tourism are explosive and in New Zealand we have already taken some giant steps to capturing the opportunities offered by this industry. What's more we are doing significant to create opportunities as well



As you can see, we are all getting more time away from our paid employment. Some of this is balanced by the entry of women into the work force in large numbers



Looking at the trend lines for consumption tend to indicate what manufacture and how we retail is about to go under considerable change



Look what's happening to the work force!

**About** 60% of US workers today are knowledge workers - 8 out of 10 new jobs in America are in information intense sectors of the economy.

The trends are going to be:


More people in the world looking for work

a lot less manual, unskilled and clerical/administrative work

more knowledge based work

with Globalisation - "knowledge work" will be drawn towards the most productive and effective sources of supply.

## www: A Constant State of Innovation



Minister  
of  
TRANSPORT

Have Your Say on Roding Reform

The pace of change and the products that will emerge from developments in the next decade alone will leave us gasping. Voice recognition will largely replace keyboards and key pads.

There will be a vast array of commercial activity available on-line

Mass communications and traditional media will take on a new persona and broadcast in different formats

Organisations and government can cut out the media filter and tell their stories unedited

and here's an example of Government online, my Road reform Forum site.

It would seem appropriate at this point I want to discuss the road reform process currently underway

While no policy has finally been set Government is committed to these key points: **retaining the current road network, no privatisation, roads being run in a more business like manner and greater input from the community.**

## Roading for the Future

“The Government supports the principle of a more commercial approach to the management and funding of New Zealand’s roads.”



**“Privatisation is not on the agenda.”**

Hon Jenny Shipley  
Prime Minister

Soon we will be entering a new millennium.

We need to move into it with a strong roading network beneath us.

This system must support the economy and support the New Zealand way of life.

The roading network has been patched up in an inconsistent manner for years.

Now, it is not a question of whether we do anything it is a question of what we do. It is also an opportunity to make our roading network safer, more efficient, and one that meets New Zealanders’ needs.

We do not want to make the mistake of doing this in an adhoc way.

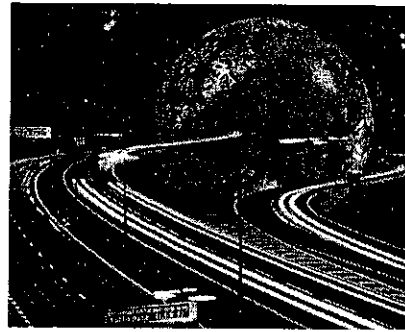
Long term decisions need to be made about the direction we are heading and the system needs to change to support that. We need a consistent approach to roading so that we have a strong sustainable roading network - that works.

The Government supports the principle of a more commercial approach to the management and funding of New Zealand roads.

## Roading for the Future

“If roads continue to be operated as one of the last relics of a Soviet-style command economy, then the consequences will be worsening traffic jams and eventual Bangkok-style gridlock.”

“Roads should be priced like any other scarce commodity.”



**The Economist**

New Zealand is not alone. Roothing problems are surfacing throughout the world.

A recent article in the Economist confirmed my opinion that we are on the right track.

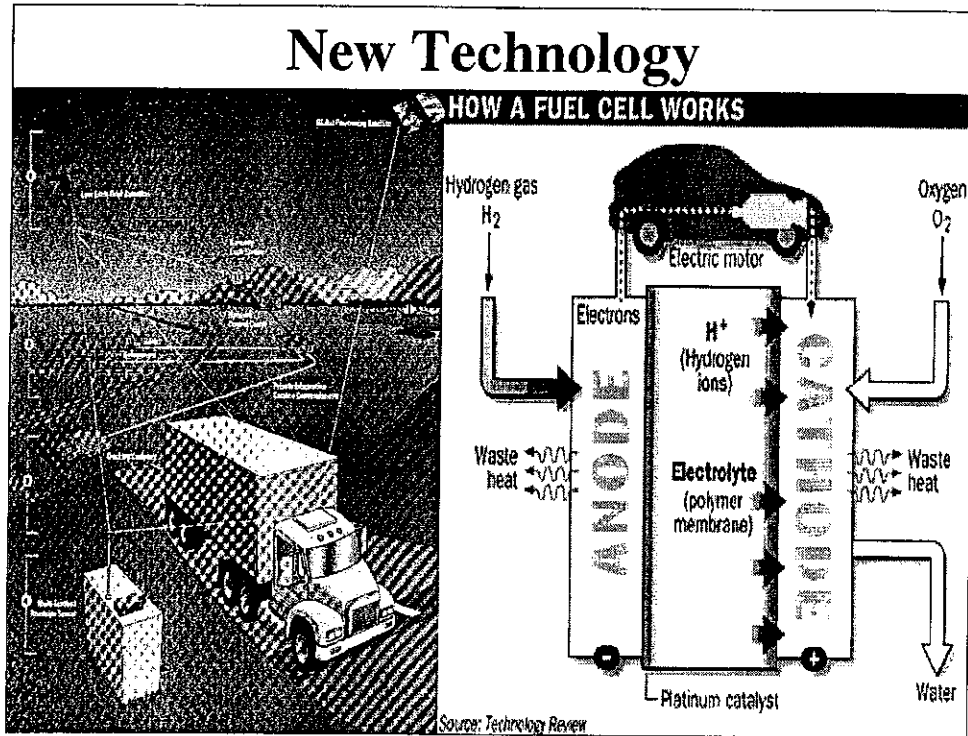
What it said - and I quote - “If roads continue to be operated as one of the last relics of a Soviet-style command economy, then the consequence will be worsening traffic jams and eventual Bangkok-style gridlock.”

It went on to say that roads should be priced like any other scarce commodity.

And that “persuading motorists that road pricing is good for them is a task that politicians around the world are only just beginning to take up.”



# New Technology

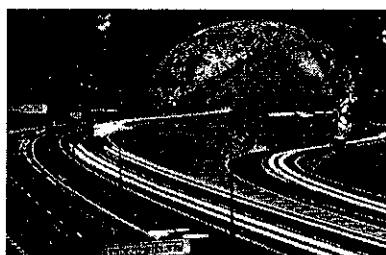


The future of roading and its guiding policy will undoubtedly be affected by new technology such as satellite tracking for congestion pricing

And emerging fuel efficient technologies such as the hydrogen fuel cell

## THE VISION

- Charges that reflect use
- Road providers that are accountable
- Ongoing investment for the future of a sustainable and safe roading system for New Zealand



We need a roading system that works for New Zealand.

We need a roading system that takes rural and urban concerns into account, and one that supports both the South and North Islands. And it must take us forward into the 21st Century.

## The Foresight Project



- About making OUR future happen
- The world is not going to be the same in the future!
- What sort of society do we want to live in?
- Foresight is about preparing for the future

**(click)** I would like to take a moment to tell you about the Foresight Project, an initiative that I am undertaking as the Minister of Research, Science and Technology.

**(click)** The idea is simple: foresight is a process for working out what might happen in the future and then deciding how we are going to respond to this. It is about making our future happen.

**(click)** Foresight is a critically important process for New Zealand. We have to ask ourselves what the world is going to look like in ten, twenty, thirty years from now. It's not going to be the same as it is now – that's for sure.

**(click)** We've got to ask what sort of society we want to be living in the next century. Are we just going to drift along with social ills getting worse, or are we going to take account of the demographic and social shifts we already know are going to come and prepare for them?

**(click)** Foresight is about preparing New Zealand for the future. My future, your future, our future.

## The Foresight Project



- Catalyst for thinking about the future
- The knowledge revolution is going to change the world
- We need to ask a series of questions

**(click)** I want the Foresight Project to act as a catalyst for thinking about where we are heading as a nation. I have initiated the project because of the urgent need to prepare New Zealand for a future in the global knowledge age.

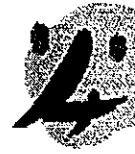
**(click)** We are right at the beginning of a knowledge revolution that is going to totally change the shape of society. In this new age, the ability to access, develop and apply knowledge will be the driver of productivity and growth. Distance will be less of a barrier, competition will become greater, the need to be smart and agile will be more important than ever, social change will be faster, the pressures on the environment will be greater

**(click)** If we want to be part of this knowledge age, we need to ask a series of questions. What kind of future do we want for New Zealand? What will be our sources of competitive advantage in the future? What core competencies will we need to build as a nation? These questions are at the heart of the Foresight Project.

And a crucial question, from my viewpoint, is - how do we make certain that we have the right science and technology to equip us for the future?

As Minister of Research Science and Technology, I need an answer to this question. I have to be certain that the Government's investment in science and technology is going to be effective in equipping New Zealand for the knowledge age. I want the Foresight Project to tell me how best to do this.

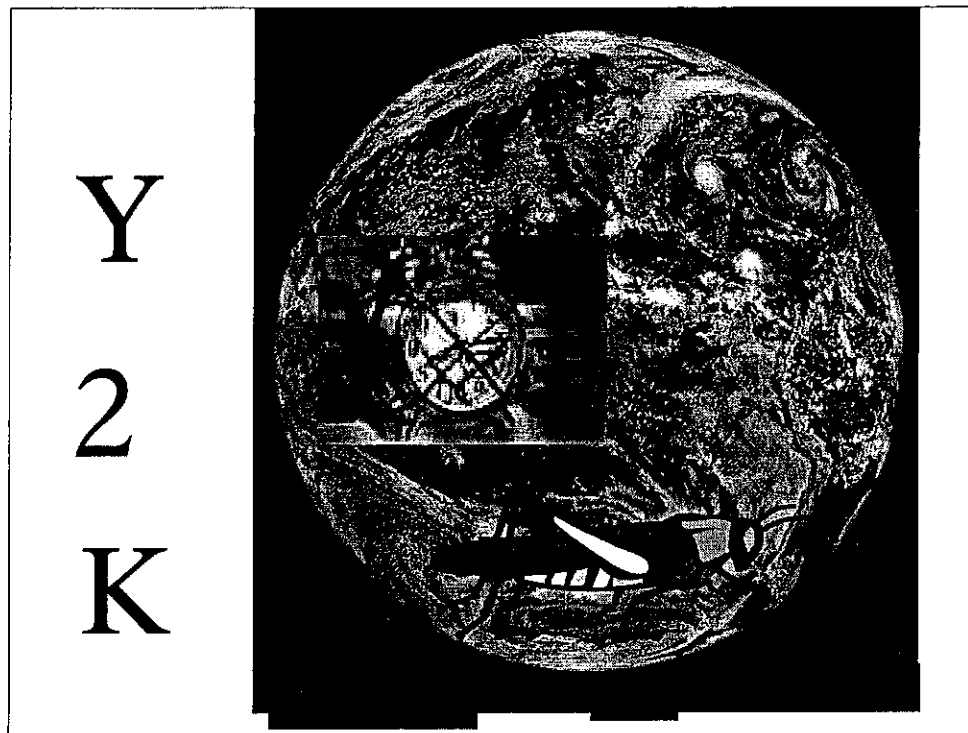
## The Foresight Project



- Spur thinking about where we are headed as a nation
- The knowledge revolution is happening!
  - We can either ignore it and be relegated to third world status, or embrace it and establish a clear path to prosperity

**(click)** The Foresight Project itself starts from concerns about the future of science and technology, but I hope it is going to spur a whole lot of thinking about where we are heading as a country.

**(click)** The knowledge revolution is happening, **(click)** New Zealand can either choose to ignore it and be relegated to third world status, or can embrace the revolution and establish a clear path to prosperity and on-going competitive advantage.



I would now like to touch on the Year 2000 problem as this is an issue that is calling on world wide collaborative efforts.

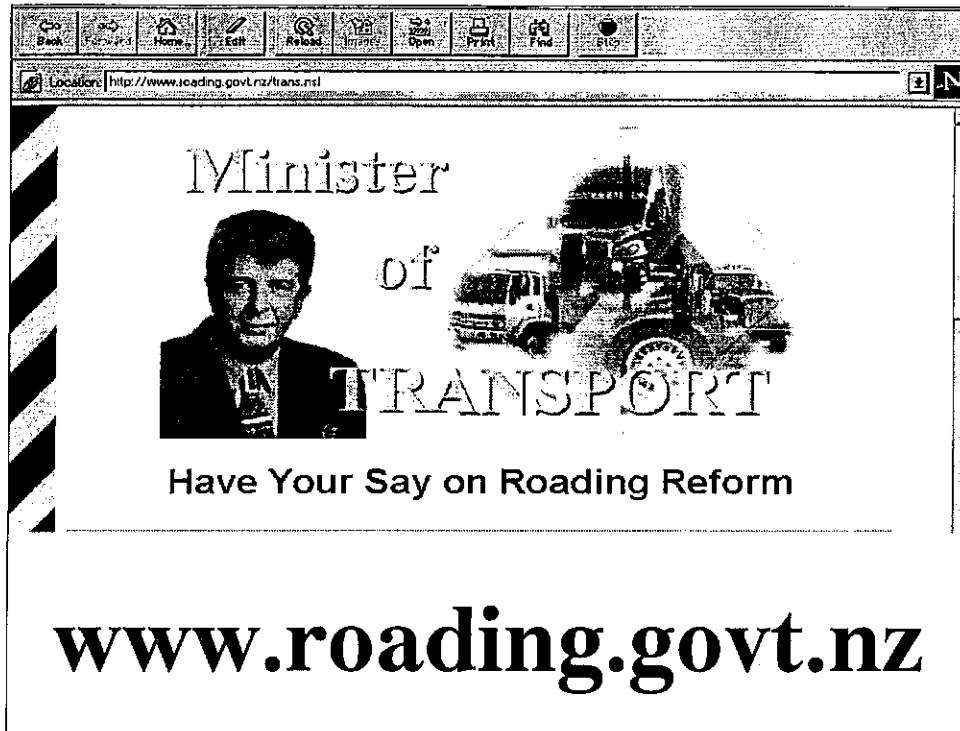
The government has established a Y2K Task force chaired Sir Basil Logan

The task force is now gathering information on whether risks arising from the year 2000 are being identified and assessed and how best to manage any threats

Special emphasis is being applied to critical infrastructure providers because of their strategic role in the community at large

The task force has sent a questionnaire to chief executives in key sectors and is asking for responses by the 15th of July.

Details at [www.y2k.govt.nz](http://www.y2k.govt.nz)



To ensure the debate on road reform is as broad as possible I have launched an online roading forum and ask that as many of you as possible use this opportunity to forward your thoughts.

In addition to the forum site, this presentation is available for either viewing on line or down loading