Bikes, Badgers and Autonomous Vehicles -

Our transport future is black

and white.....

maybe with a bit of grey

Richard Young

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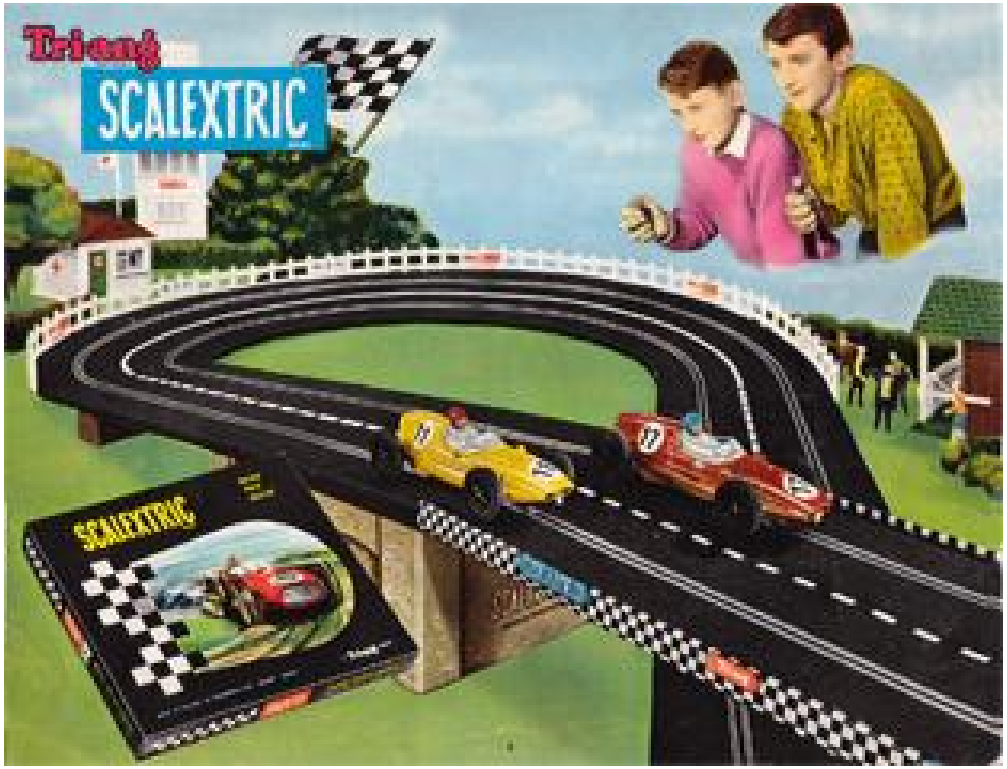
Autonomous Vehicles

A short, and unauthorised history.



How safe do Autonomous Vehicles have to be?

Isaac Asimov's
"Laws of Robotics“ (1942)

A robot (*autonomous vehicle*) may not injure a human being or; through inaction, allow a human being to come to harm.

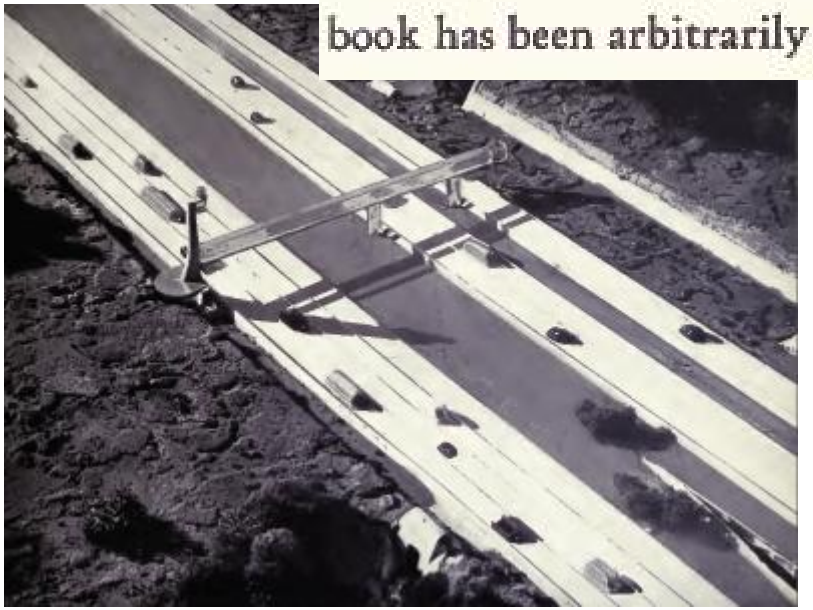
OR

A robot (*autonomous vehicle*) may occasionally injure a driver, passenger or pedestrian; or through inaction, allow a them to come to harm – but on the whole it’s a safer driver than a human.

1940’s

Radio controlled, automated cars by 1960.

The Motorway System as visualized in the Futurama and described in this book has been arbitrarily dated ahead to 1960—twenty years from now. But

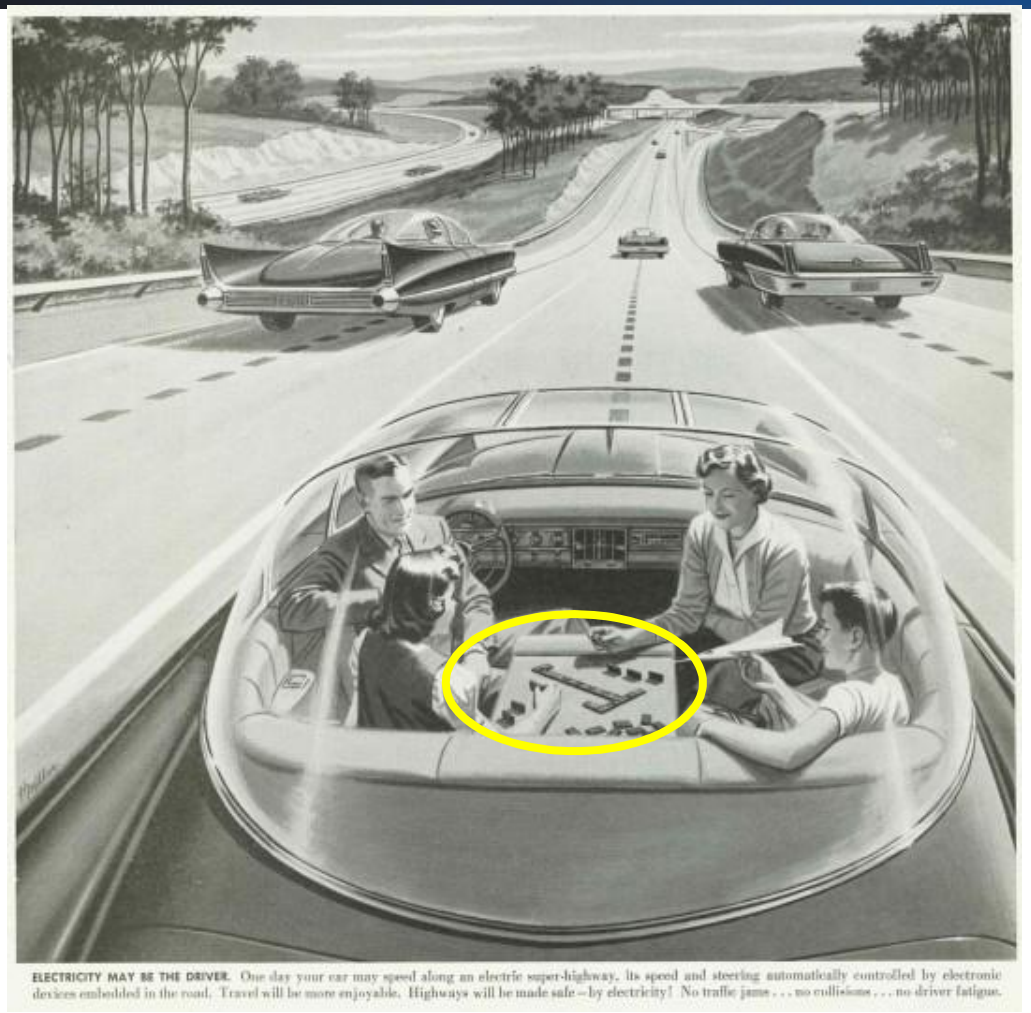


1950's

Cars following in-road markers,

Dominos on the move.

All achievable by the 1970s.



ELECTRICITY MAY BE THE DRIVER. One day your car may speed along an electric super-highway, its speed and steering automatically controlled by electronic devices embedded in the road. Travel will be more enjoyable. Highways will be made safe – by electricity! No traffic jams . . . no collisions . . . no driver fatigue.

1960's

Hands-free driving – free for pipe smoking and magazine reading.

Dominos replaced with a TV

A vision of the 1980's.

NO-HANDS DRIVING is easy with wheel-less car —roadway groove holds it on course. Electronic controls would be needed only at junctions.

68 POPULAR SCIENCE AUGUST 1961

1970's – Real Progress

Real vehicles.

The heady heights of 30 km/h.

No Dominos

Automatically Operated Car

Tsukuba Mechanical Engineering Lab, Japan, 1977. This pioneering computerized driverless car achieved speeds of up to 20 miles per hour, by tracking white street markers with machine vision.

1980’s – Forget Cars – Vans are the thing

Ernst Dickmanns’ Mercedes van, Bundeswehr University Munich.

German Engineering at its most cutting edge.

1990’s The ARGO Project

Italian styling and flair

Self driving car

1000km driven

October 2015 - Google

Miles driven since start of project in 2009

"Autonomous mode" means the software is driving the vehicle,

- Autonomous mode: 1,268,108 miles

Autonomous Vehicles in action - Bordeaux

BORDEAUX 2015

22nd ITS World Congress
Bordeaux, France
5 to 9 October

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Meet Ian ..

6 broken ribs,

1 broken collar bone,

1 cracked shoulder,

2 cracked vertebrae.

Isaac Asimov's "Laws of Robotics“ (1942)

A robot may not injure a human being or, through inaction, allow a human being to come to harm.

N.B. Does not apply to badgers

Badger In the Room Questions

Questions for
Society
NOT
Engineers

Badger In the Room Q1 – “Hand Over”

When does the vehicle become autonomous?

Is the driver always a passenger?

What does the ‘driver’ do when not driving?

Badger In the Room Q2 – “Hand Back”

Pilots spend 1000’s of hours sitting there following check lists.

$100,000s to train a pilot to take over at the right time and do the right thing.

Badger In the Room Q2 – “Hand Back”

Up to 17 seconds to re-engage with driving.

How do we train drivers to be pilots?

Badger In the Room Q3 -10

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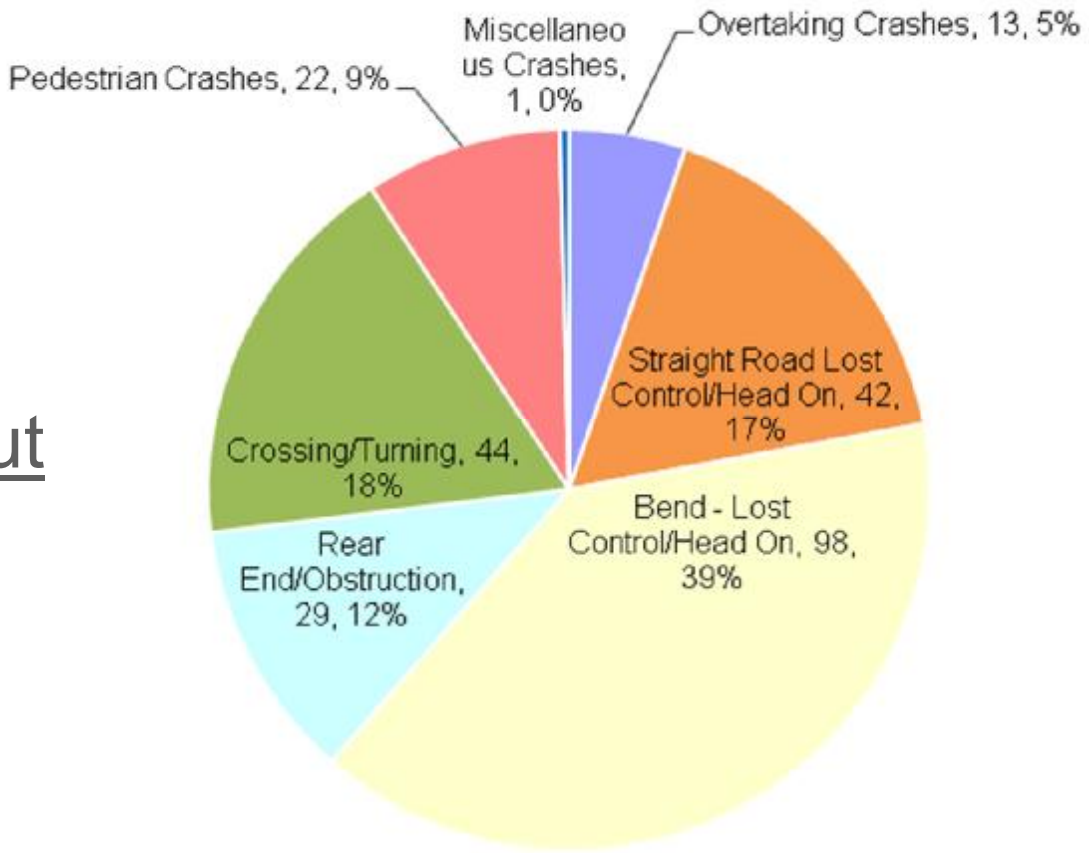
Where is NZ really at?

All of these areas can be dramatically improved without Autonomous Vehicles.



Augment and Assist not Autonomous Vehicles

Adaptive Cruise Control.

Match speed to the vehicle ahead.

Provide key info on windscreen.

Driver still drives.

Maintaining the Correct Lane.

Warns driver of lane-straying visual/ audible/ physical

Auto-correct lane straying

Pedestrian / Cyclist Safety

360 degree cameras

‘Digital’ mirrors

Distraction Detection – Driver Monitoring

Check for tiredness,

Check for distractions,

Alert driver, inform operator,

Disable vehicle.

It’s not all about the vehicle

the way we
choose to travel by
road is evolving.

Sharing .....Ride / Cars - used to be called a ‘Taxi’

cityhop
cars by the hour

carpool

CarpoolKing

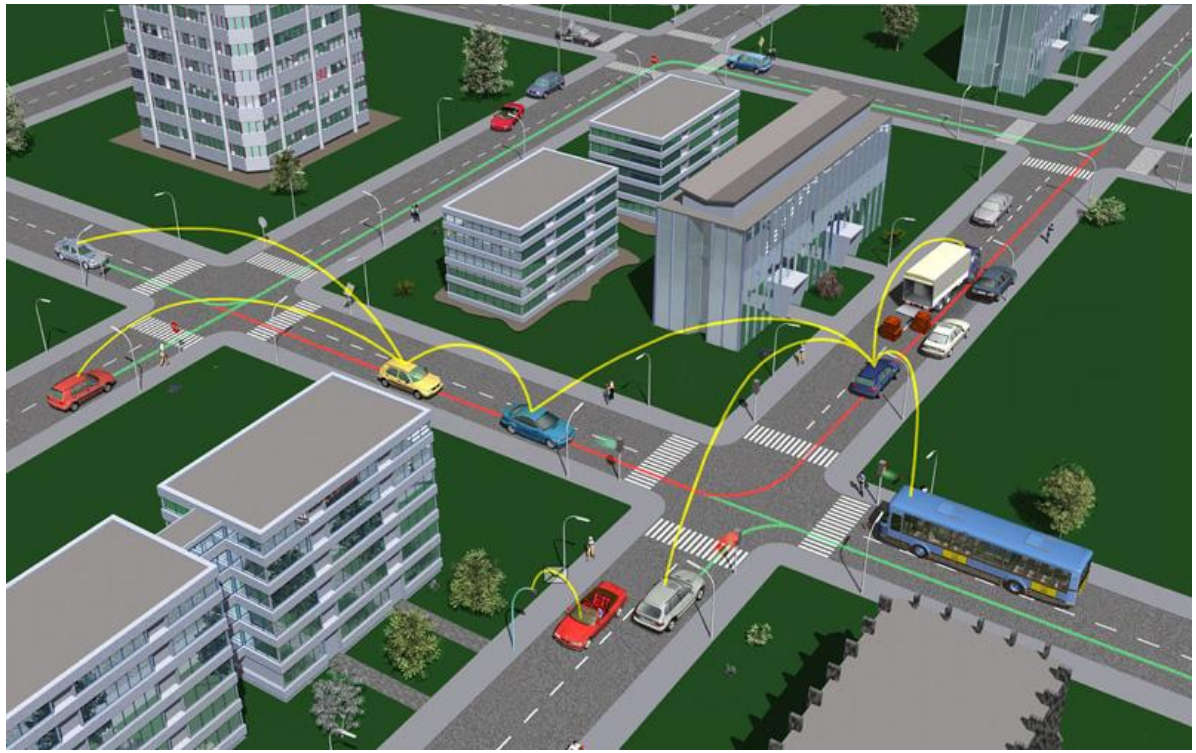
CHARIOT

Sharing .. Information

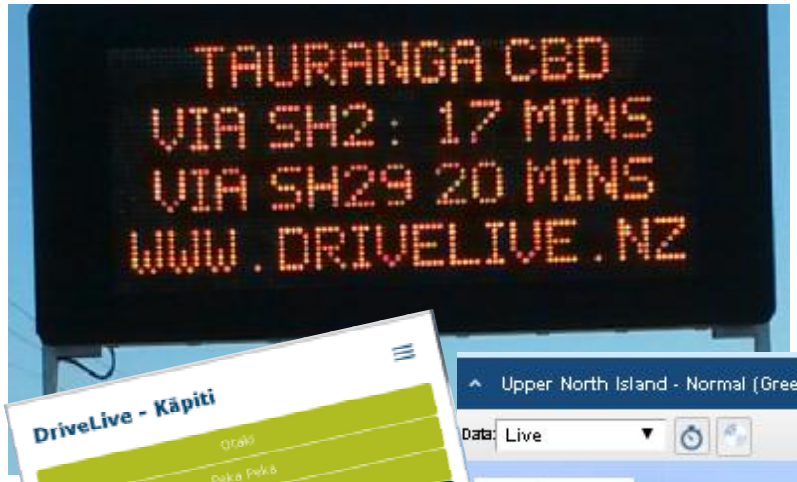
Could be in-vehicle system.

More likely smartphone based.

Integrate roadside sensors with vehicles.



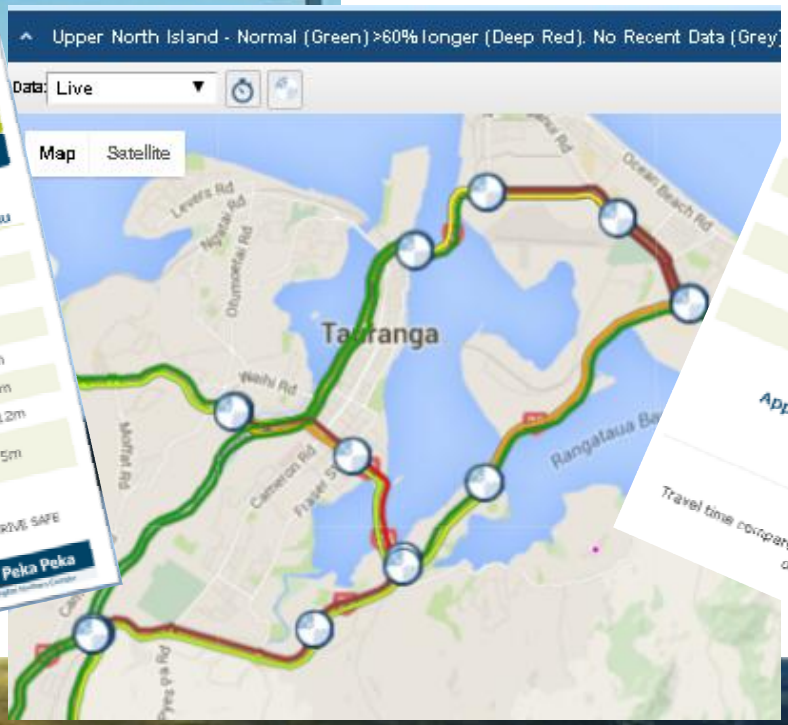
Sharing .. Information



From: BlipTrack [mailto:support@blipsystems.com]
Sent: Thursday, 19 November 2015 10:51 a.m.
To: Richard Young; R.Morris@higgins.co.nz
Subject: *** MANAWATU GORGE TMP ALERT EASTBOUND DELAYS ***

Eastbound Traffic is being delayed by in excess of 8 mins and has not improved in last 10 minutes

Current Transit time: 13 minutes
Latest sample count: 15



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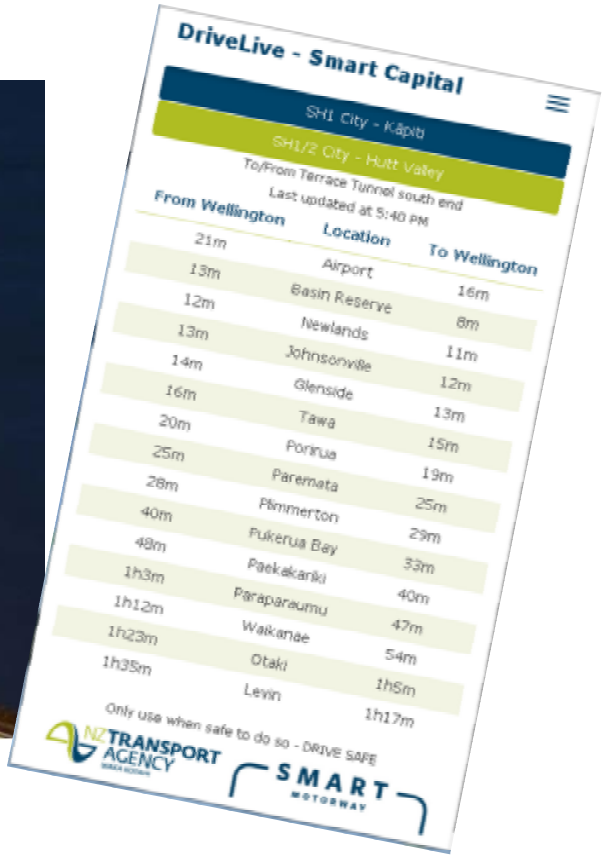
Sharing .. The road more efficiently

NGAURANGA TO AOTEA QUAY PUTTING THE SMARTS INTO WELLINGTON'S URBAN MOTORWAY

WELLINGTON'S SMART MOTORWAY



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Suggestions for Policy Makers and RCA

NZ is predominantly a high risk two lane road environment.

Focus NZ talent on distracted driver detection, and systems that reduce run off road and head-on crashes.

Encourage safe ride sharing - be Enables not Providers.

Promote live information sharing – whilst protecting privacy.

Recognise that the widespread use of truly Autonomous Vehicles is 20 years away.

And always will be…

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