

Future Moves

The future of mobility in New Zealand



**House
View 02**
December 2017



We believe the way people get from A to B is primed for dramatic change and that Z has a significant opportunity to shape this revolution in New Zealand.

There's growing uncertainty over the future of mobility. We've been doing some thinking on what this future may look like and have tested that thinking with leading worldwide connections. We see technology development as the catalyst to a significantly different future for mobility – one that is

compelling and accessible to more. While uncertainty exists around the timing of this revolution, we believe there is a major participatory role for Z to play here in New Zealand. Future Moves, our future of mobility experience, provides a snapshot in time of this opportunity.



“ In the face of greater uncertainty, it can be risky and, over time, value destroying to bet billions of dollars on assets that must live productively for 30 years. In contrast, agility – small initial footprints, investments in real optionality to monitor markets for a couple years before deciding how best to grow, the capability to rapidly adjust – is a better fit for a highly volatile world. **”**

**WEF / McKinsey Whitepaper
“Game Changers in the Energy System”**

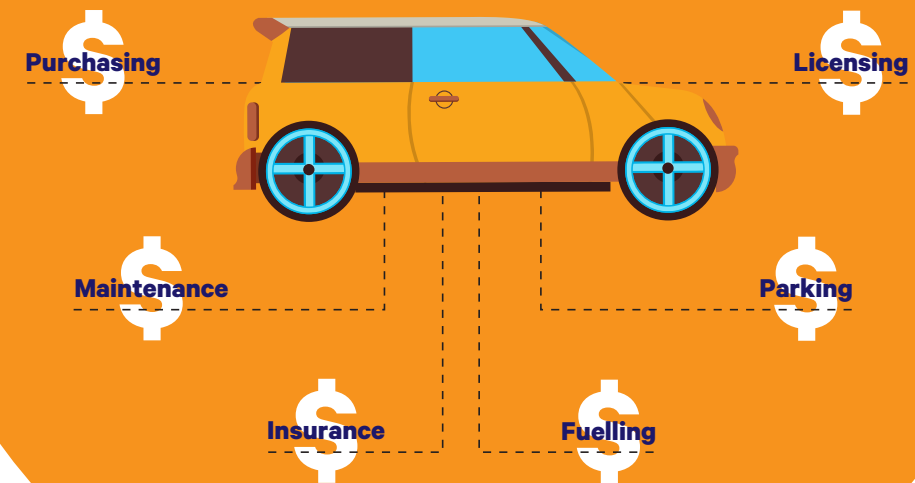
The Future of Mobility Will Look Revolutionarily Different

The private car is running out of space in major cities, with congestion, pollution, low utilisation levels and a rising cost of ownership all weighing in on its viability. At the same time, the digital revolution is radically changing the way we access services, offering up new, customer-focussed solutions that challenge the status quo i.e. Uber, Airbnb and the like.

Mobility is not exempt, with driverless electric vehicles acting as the disruption trigger to a transformation of the current ecosystem. From an array of established automotive and technology companies, as well as start-ups like nuTonomy and Cruise, new pay-as-you-go autonomous offerings will disentangle traditional car ownership.

From

Mobility today consists of individual vehicle ownership and multiple touchpoints.

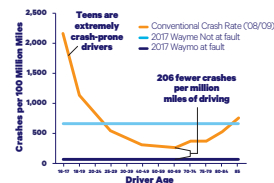


To

We believe autonomous electric vehicles could unlock an on-demand mobility future.

Safer

Waymo crash rates show a dramatic improvement compared to conventional driving.



Simple

A couple of taps on your phone!

Cheaper

Transport-as-a-service (TaaS) will offer vastly lower-cost transport alternatives — four to ten times cheaper per mile than buying a new car and two to four times cheaper than operating an existing vehicle.

Source: Rethink Transportation 2020-2030, May 2017



Accessible to more people

This revolutionary change is supported by these key drivers

Technology development

Autonomous ecosystem financing has reached a run rate of over \$2B in 2017. Source: CBInsights.

In addition, vehicle manufacturers and tech companies are investing heavily in acquisitions and internal technology development.



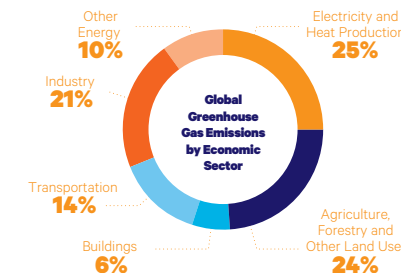
Air quality concerns in cities

Worldwide, ambient air pollution contributes to 5.4% of all deaths.



Impact of climate change

Transport makes up 14% of global greenhouse gas emissions. And climate change is already having an impact.



Asset utilisation

The sharing economy megatrend is improving asset utilisation – thanks to the sharing economy you can easily rent out your car, your apartment, your bike, even your wifi network when you don't need it!

August 5, 2017 was Airbnb's biggest night to date, with over 2.5 million people staying on the platform. On any given night, 2 million people are staying in other people's homes around the world on Airbnb.

Source: Airbnb Fast Facts

40% TaaS vehicle utilisation, 10 times higher than individually owned (IO) vehicle utilisation. IO cars are used only 4% of the time. While there will be fewer cars, TaaS vehicles will be available on-demand 24 hours per day, providing door-to-door transport to passengers. As a result, TaaS vehicles will be utilized 10 times more than IO vehicles.

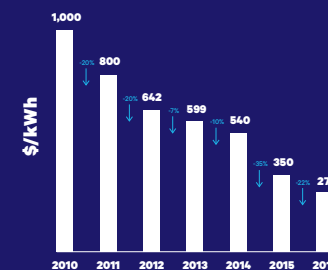
Source: Rethink Transportation 2020-2030, May 2017

The Building Blocks to the Future

The future of mobility requires the smart combination of electrification and autonomy, leading to a mobility on demand world.



2010-2016 Lithium-ion battery price survey



Source: Bloomberg New Energy Finance

Electric vehicles

Price Parity

We believe that battery technology development will enable future purchase price parity with internal combustion engine vehicles.

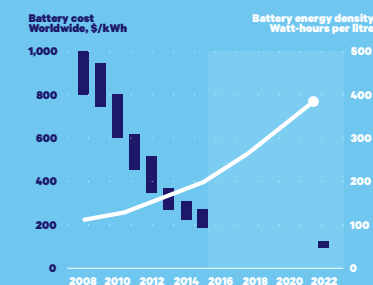
Economical & Fun!

We believe that the electric vehicle experience will be compelling from an economic perspective, but will also offer a highly engaging driving experience.



0-100km in 3 seconds!

Watt next?



Source: US Department of Energy

Tesla's Gigafactory - Nevada, USA



6%

A recent report highlights that there was only a 6% battery degradation on a Tesla driven 200,000 miles!
Source: Tesloop



Autonomous vehicles



It'll be electrifying!

We believe autonomous vehicles will be electric due to their operational life-cycle cost benefits and lower emissions.



'When' not 'if'

We believe it's a question of 'when' and not 'if' leading global companies achieve full unrestricted autonomy.



2022: A Car Odyssey

Autonomous vehicles operating in the wild are still up to five years away given the technical and social challenges to overcome as AV's learn to coexist with human drivers and unpredictable pedestrians.



Mobility on demand

"New Zealand supports safety and productivity innovation, and welcomes manufacturers and developers wanting to test autonomous vehicle technologies."

Source: NZTA

The catalyst to a mobility revolution

Driverless vehicles are the catalyst to a revolution in mobility, but they require regulatory approval.

State of California Autonomous Vehicle

Tester Program Current List of Approved Participants

- Volkswagen Group of America
- Mercedes Benz
- Waymo
- Delphi Automotive
- Tesla Motors
- Bosch
- Nissan
- GM Cruise LLC
- BMW
- Honda
- Ford
- Zoox Inc.
- Drive.ai Inc.
- Faraday & Future Inc.
- Baidu USA LLC
- Wheego Electric Cars Inc.
- Valeo North America, Inc.
- NextEV USA, Inc.
- Telenav, Inc.
- NVIDIA Corporation
- AutoX Technologies Inc.
- Subaru
- Udacity, Inc.
- Navya Inc.
- Renovo.auto
- UATC LLC (Uber)
- PlusAI Inc.
- Nuro, Inc.
- CarOne LLC
- Apple Inc.
- Bauer's Intelligent Transportation
- PonyAI
- TuSimple
- Jingchi Corp
- SAIC Innovation Center, LLC
- Almotive Inc
- Aurora Innovation
- Nullmax
- Samsung Electronics
- Continental Automotive Systems Inc

THE WALL STREET JOURNAL

WORLD'S FIRST SELF-DRIVING TAXIS HIT THE ROAD IN SINGAPORE

By Jake Maxwell Watts, Aug. 25, 2016

NEW YORK TIMES

Waymo to Offer Phoenix Area Access to Self-Driving Cars

By David Streitfeld, April, 2017

NEW YORK TIMES

Self-Driving Cars' Prospects Rise With Vote by House

By Cecilia Kang Sept. 6, 2017

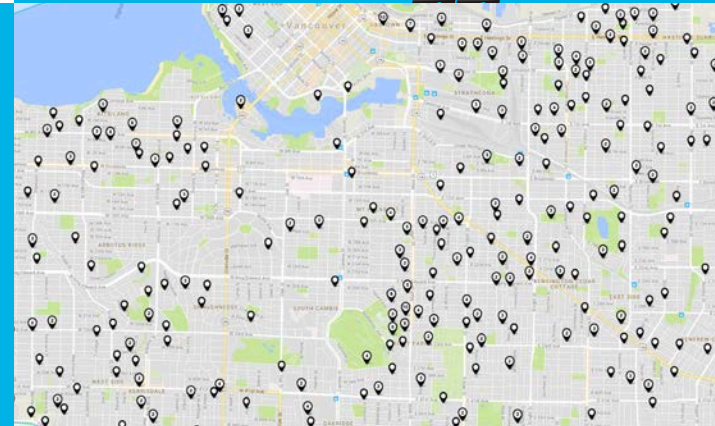
FINANCIAL TIMES

Michigan passes new laws for driverless car trials

By Peter Campbell Dec 10, 2016

Scale Matters

We believe scale matters in providing mobility on demand, enabling a better customer experience and greater asset optimisation. Early movers stand to gain dominant market positions in each respective geographical region.



Future Value Chain

The future market for mobility is big business.

A new vision for mobility is emerging, one in which service-based businesses are changing how cities move. The assumption that we need to own the vehicle in which we travel is dissolving. New 'ride hailing' based mobility ecosystems are attracting capital and threaten to disrupt the traditional business models of the past. A lot of companies have aspirations of owning the future value chain, resulting in uncertainty over who will develop the scale to become the dominant regional champions.



Mobility is big business

Globally, personal transportation is a \$7 trillion dollar market, with the NZ market estimated at \$12 billion per annum (equivalent to 5% of NZ's total GDP).



It's not a solo play

We believe no one company will provide end-to-end autonomous pay-as-you-go mobility services. In addition to self-driving technology there are a number of other, significant aspects that will be required.



Customers

Mobility on Demand

Vehicles

Infrastructure
Including land



The 5 key components of a mobility on demand offering

1

Customer platform

A brand comprising customer recognition and customer service, high-density maps and optimisation algorithms to match demand with that of the fleet.

2

Fleet management

Infrastructure for vehicle parking, charging ("fuelling") and servicing.

3

Fleet financing

Access to capital to purchase the fleet.

4

Fleet manufacturing

Competencies to physically build vehicles complete with integrated autonomous systems.

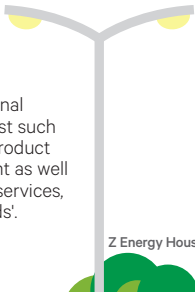
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Self-driving tech

The enabling AI software.

Additional value opportunities

We believe that additional value opportunities exist such as in-car advertising, product sales and entertainment as well as providing 'last mile' services, i.e. the delivery of 'goods'.





Z's Opportunity

Z's unique attributes give us a significant opportunity to shape the future market for mobility in New Zealand.

Z has attributes that are unmatched or hard to replicate in the NZ market



Our nationwide footprint

80% of New Zealand's population live within 5km of a Z service station.



COLMAR BRUNTON
CORPORATE REPUTATION INDEX

We are one of New Zealand's most established and trusted brands

- Second equal best in the Colmar Brunton Corporate Reputation Index 2017.



Trusted relationships with consumers and businesses

- 55 million annual retail transactions.
- 44 thousand direct relationships with small and medium businesses.

Our Ecosystem

We have many of the components required within our ecosystem to shape the future of mobility in New Zealand. From our broad customer offering and access to local capital, to our servicing model and unique opportunity to develop fleet management capability - Z are in an enviable position to drive the future of mobility.



