

RED PAPER

Innovation Explained: Tax, One Mile at a Time



EROAD



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In June 2017, a major milestone was reached. For the first time more than 50% of all Road User Charges (RUC) from heavy vehicles were collected electronically in New Zealand. This is significant, because it is not mandatory to use an electronic system provider, which means that the transport operator opted to use an electronic solution because of the benefits provided.

This paper takes a brief look at the evolution of the electronic RUC (ERUC) system and EROAD's contribution.

MIND THE GAP

It is well known that the widespread adoption of fuel efficient, hybrid and electric vehicles has steadily undermined the efficacy of traditional fuel taxes as an instrument for transportation funding. When combined with long-standing issues around infrastructure maintenance and increasing expenditure forecasts, there is growing interest in the adoption of electronic road user charges as an alternative funding mechanism to meet future revenue demands and to more efficiently manage the gap between funding and expenditure.

EROAD was founded with the goal of developing a technology-based solution to modernize paper-based road tax systems, to help transport operators meet the ever-increasing regulatory requirements with an easy-to-use system, while at the same time lowering the costs of compliance and reducing the administrative burden for transport agencies. The vision was to prove that it is possible to deliver regulatory and commercial services on the same technology platform to lower costs for the carriers and deliver a higher ROI.

NEW ZEALAND – A LITTLE HISTORY

New Zealand is a pioneer in implementing a national road user charge. The country introduced the Road User Charge (RUC) system in 1977 to charge users based on their impact to the road network. RUC applies to diesel powered vehicles and all vehicles (including trailers) with a gross laden weight of 3.5 tonnes or greater. Operators of such vehicles must purchase distance licenses which are pre-paid ahead of the distance driven. When the New Zealand system was introduced, the Oregon Weight Mile tax system – already introduced in 1933 – was studied closely.

The RUC system has been updated and simplified a number of times since its first implementation as advancements in technology enabled modernization of the RUC regime. A significant change was to allow for the measurement of distance using an Electronic Distance Recorder. This change had been driven by EROAD, a private sector technology provider, who introduced the first autonomous GPS/cellular electronic road charging system for heavy and light vehicles in 2009. Previously, all reading and calculations were captured using mechanical hubodometers.

New Zealand's approach to introduce electronic RUC was to create an open system, whereby the New Zealand Transport Agency (NZTA) is empowered to approve technology operators (called "Electronic Service Providers") to operate electronic systems and produce electronic distance recorders to collect ERUC based on standards developed by a committee. Requirements Electronic Service Providers must meet include ensuring the system can detect tampering with the device and that the distance recorder is tamper proof, accurate and fit for purpose. Independent security teams nominated by NZTA can also conduct audits, verifying the integrity of the data and processes, and ensuring the system meets appropriate levels of security and reliability.



Although the New Zealand government has enabled transport operators to pay RUC electronically, it is not mandatory to use an electronic system, and operators can choose to remain with the paper-based RUC methodology. One of the key differences that has therefore emerged in New Zealand compared to other road charging solutions, which has been driven by the open system approach, is that commercial and regulatory services can be offered via one technology platform; this lowers costs for both clients and agencies. The value-added services offered include tools to manage tracking, compliance, driver behaviour, fuel, maintenance and safety.

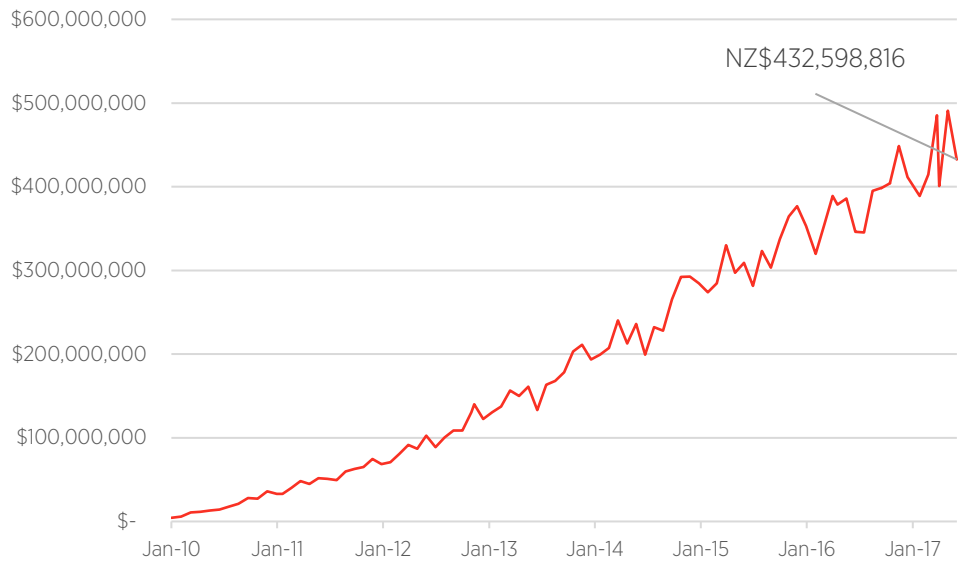
EROAD'S APPROACH

EROAD's goal was to help transport operators easily meet their compliance obligations. However, it also lowered the cost of compliance and administrative burden for the transport agency and reduced tax evasion - which was estimated at more than NZ\$30 million* per year for heavy vehicles alone. To achieve this, EROAD worked with the transport industry, the NZTA and the Police's commercial vehicle enforcement division CVST to find the best possible solution.

A critical element in launching ERUC was to create a secure and reliable technology and transaction gateway; EROAD developed and funded this gateway to implement the NZ ERUC regime. EROAD's system was approved after extensive field trials, independent testing and third-party security review, at no cost to the government, and it has served as the template system that all other operators must follow in order to collect RUC electronically in New Zealand.

The success of EROAD's ERUC system and payment gateway can be demonstrated by the significant amount of Road User Charges EROAD has collected on behalf of the New Zealand government since its introduction in 2009. Over the past seven years alone, EROAD has collected over NZ\$1.53 billion in RUC.

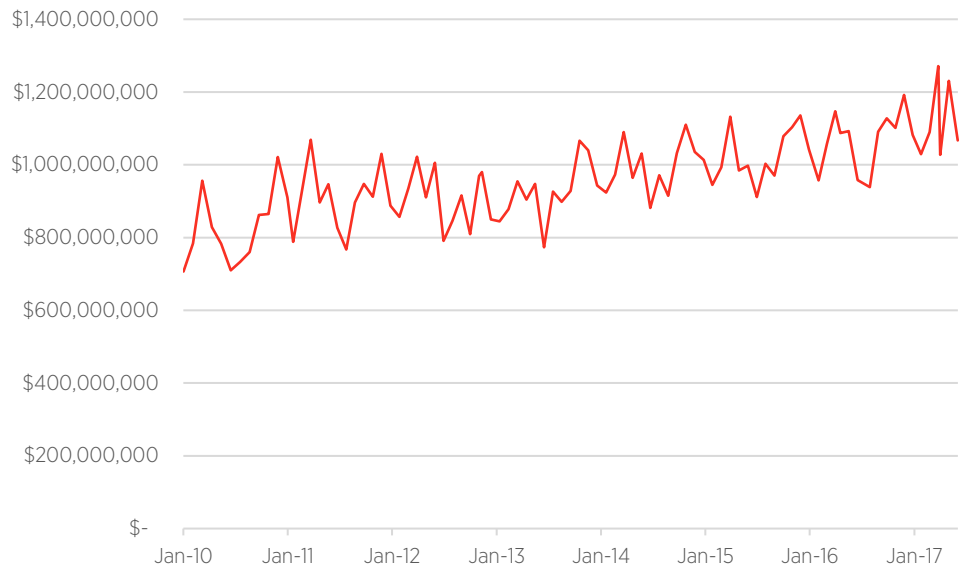
EROAD ANNUALIZED RUC COLLECTION (\$NZ)





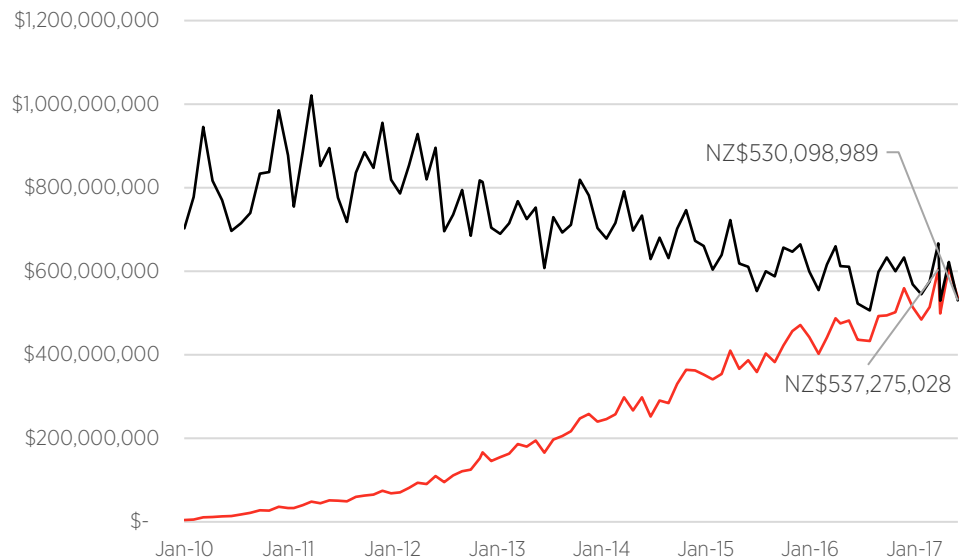
Annualized total Heavy Transport RUC has increased from NZ\$900 million to NZ\$1.1 billion in 2017.

ANNUALIZED TOTAL HV RUC (NZ\$)



The adoption of electronic RUC has grown continuously and now 50% of all heavy vehicle RUC is being collected electronically. This is a significant milestone demonstrating how New Zealand technology innovation has driven this change.

TOTAL HEAVY VEHICLE RUC COLLECTIONS (ANNUALIZED \$NZ)





**COMING FULL CIRCLE:
EXPORTING THE ERUC SOLUTION TO THE UNITED STATES**

Oregon has employed a weight mileage tax for commercial heavy vehicles since 1933. The state is one of just four in the US that uses a distance-based charging for commercial heavy vehicles. More than 300,000 vehicles are required to pay weight mile tax to the Oregon Department of Transportation (ODOT) based on the vehicle’s weight configuration and the miles travelled in the state.

Commercial motor carriers are required to submit reports to ODOT on a recurring filing period for each of the qualifying vehicles that they operate. This requires that, for each vehicle, the carrier must maintain detailed travel records which must be made available to ODOT auditors for inspection upon request.

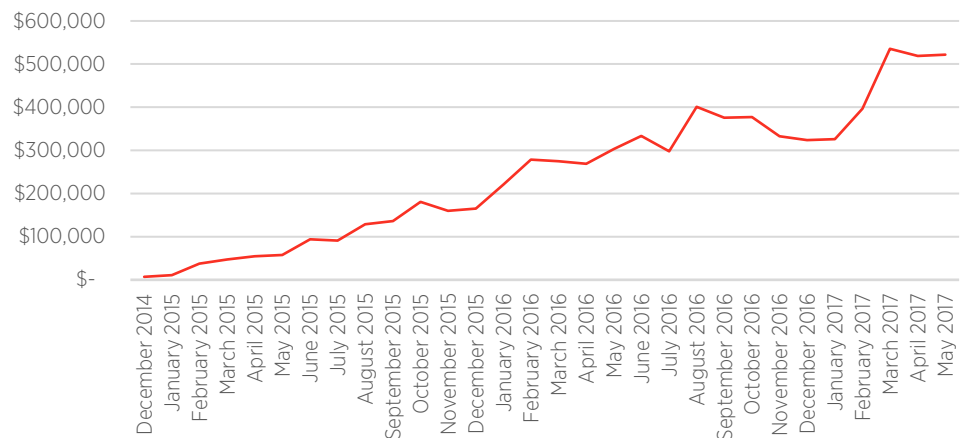
In 2012, with the support of ODOT and the Oregon Trucking Association, EROAD initiated a large development project to build an electronic weight-mile tax service as a replacement for the existing paper-based system. The approach to implementation and partnership with key stakeholders was almost identical to what EROAD had done in New Zealand a couple of years prior.

Oregon weight mile tax regulations are generally permissive and allow carriers to use electronic systems to meet record keeping requirements. It goes without saying, this allowance comes with the strict proviso that the carrier maintains complete and accurate records of information pertaining to the weight mile tax reports.

From 2012 to 2013, EROAD completed a field pilot of its electronic weight mile tax platform with 11 carriers fitting EROAD hardware to 70 vehicles for a period of 6-12 months. To provide assurance and confidence for the EROAD electronic weight mile tax system, the data from the pilot was reviewed by the Oregon Secretary of State Audit Division which conducted an extensive independent security and performance audit and assessment of the EROAD solution against federal and state audit guidelines.

In its audit report, the audit’s division gave EROAD’s electronic weight mile tax service an independent and unqualified audit opinion that the hardware and software platform accurately and reliably captures, processes and stores the weight mile tax information in line with the appropriate record keeping requirements. Moreover, the audit found the EROAD data, reports, and records to be more reliable and accurate than the paper-based records compiled and filed by carriers, which were prone to human error.

EROAD WMT COLLECTED - MONTHLY (\$US)





The audit process and approval framework employed a combination of outcome-based requirements, independent audits and vendor self-certification. When combined, this represents a sensible and sustainable approach to the approval of technology-based services.

Since the introduction of electronic payment in Oregon in December 2014, adoption is continuously growing and EROAD has collected more than US\$8 million of weight distance tax for the Oregon Department of Transportation.

An innovative aspect of the New Zealand and Oregon deployment is the fact that development and implementation was achieved without any significant cost for the government. By enabling a private sector technology service provider, such as EROAD, to develop and provide the electronic system and services to the carriers directly for a monthly fee, it has effectively alleviated the government agency from bearing procurement costs, and technology and project implementation risks.

The pioneering partnerships and frameworks forged in New Zealand and Oregon have created global case studies for the implementation of electronic road user charging with an open system approach. The case for moving to electronic road user charging offers many compelling benefits such as:

- lowering the cost of compliance for all parties through automation;
- simplifying the administration of off road trips and refunds;
- reduction of tax evasion – which was estimated at more than NZ\$30 million per year in New Zealand. In contrast, Oregon has seen historically low evasion rates due to the early implementation of its weight mile tax framework; the proliferation of technology has served to further reduce weight mile tax evasion from the measured 1994 low result of 5.4%;
- reducing the administrative burden for agencies and transport operators;
- preparing for alternative engine vehicles.

Furthermore, the successful implementation of EROAD's electronic RUC system in New Zealand and Oregon have demonstrated that:

- GNSS based road charging solution is proven and cost effective;
- the technology solution meets the highest technical, performance and security standards;
- regulatory and commercial services can be delivered on the same technology platform to lower costs for the carriers and deliver a higher ROI;
- a certification model, whereby the government agency employs technical and performance standards to approve a private sector technology solution, significantly reduces the risk that the public sector bears in relation to technology or capital and operating costs; and
- finally, high industry acceptance is proven as transport operators voluntarily embrace and, ultimately champion, technology to improve business and compliance outcomes.

LOOKING AHEAD

Around the world, governments are studying how to maintain adequate transportation funding.

Using the United States as an example, it is undisputed that up until now, fuel taxes have been the workhorse that have predominantly contributed to the Highway Fund, collected and used at the federal and the state levels. However, all levels of the federal and state governments are becoming increasingly aware that revenue from traditional fuel taxes, as an instrument for transportation funding, has been steadily declining, and will continue to do so by the widespread adoption of fuel efficient and electric vehicles.



This has therefore led to a number of pilot initiatives, subsidized by government agencies and evaluated by industry professionals, being undertaken to explore alternative ways to plug the infrastructure funding shortfall that is emerging.

One such pilot occurred recently in California. This Road Charge Pilot Program was initiated by the California Legislature, which passed CA Senate Bill 1077 in 2014. The Road Charge Technical Advisory Committee, created by the legislation under the California Transportation Commission, agreed that the scope of the pilot should cover both heavy and light vehicles. In 2016, EROAD was selected as the sole technology provider and account manager to heavy vehicles for the California Road Charge Pilot Program. The pilot operated for nine months, from July 1, 2016 through March 31, 2017. During the pilot, EROAD enrolled and supported the 55 participating heavy vehicles spanning nine industry segments. Taken together, the total number of heavy and light vehicles enrolled in the project exceeded 5,000, making the California Road Charge Pilot Program the largest road charge pilot to date in the United States.

While heavy vehicles represented only 1% of the total number of vehicles enrolled in the pilot, these vehicles accounted for almost 10% of the total miles travelled during the pilot by all participating vehicles (including light vehicles) and were responsible for more than half of the associated road wear. Engineers estimate that a fully loaded truck at the interstate maximum legal weight of 80,000 pounds causes more damage to a highway than somewhere between five and ten thousand cars.

SMALL BUT MIGHTY

New Zealand's early adoption of new technology and the rapid penetration of eCommerce provides a standard-setting framework that can be evaluated and assimilated into transportation markets across the globe. Vision, private sector innovation and a progressively-minded public sector have been critical components of the move toward ERUC.

EROAD's goal remains the same: to bravely solve complex transportation problems across the global landscape, delivering intuitive solutions to serve our communities and help our customers, government agencies and stakeholders succeed.

EROAD continually monitors world regulatory environments and partners with government agencies and stakeholders to provide expertise and innovative approaches to solve complex problems.

Resources: *<http://www.transport.govt.nz/land/roadusercharges/roaduserchargeslegislationchangesqandas/>

Nina Elter, Vice President, Global Market Development

Nina leads EROAD's Global Market Development team and is responsible for finding and evaluating new opportunities on the global landscape. She joined EROAD in 2012 and has more than 20 years of experience working within the technology, trucking, tolling and fuel card sectors.

Nina was a key architect in the development of EROAD's Oregon Weight Mile Tax product, including managing the pilots conducted alongside the Oregon Department of Transportation and the Oregon Secretary of State; she also acted as point on the company's participation in the California Road Charge Pilot.

ABOUT EROAD

EROAD modernizes road charging and compliance for road transport by replacing paper-based systems with easy-to-use electronic systems. The company is headquartered in Auckland, New Zealand, and listed on the New Zealand Exchange (NZX). Its US business is based in Portland, Oregon. EROAD is also a leading provider of health and safety compliance services, including vehicle management and driver behaviour and performance measures.