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# Logistics & Transport NZ

THE OFFICIAL PUBLICATION OF CILT NEW ZEALAND

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## CILT NZ AWARDS 2020 – excellence and innovation in a tough year

Port Otago – a rich history of primary exports

Assessing and forecasting demand and revenue for toll roads in NZ

Mercy Ships nears completion of the Global Mercy



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The Charter Institute of Logistics and Transport

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#### In the next edition

The editorial team welcomes expressions of interest for submitting an article for the March 2021 edition of this journal. Contributors should in the first instance contact the editorial convenor, Murray King (email [murray.king@xtra.co.nz](mailto:murray.king@xtra.co.nz)) to discuss their article.

**Deadline for the March edition: Friday 26 February 2021**



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## GUEST EDITORIAL

# There are still many challenges ahead

By Michael Wood, Minister of Transport

The new Government's top priorities are keeping New Zealanders safe and accelerating our economic recovery from Covid-19

I AM very happy to be able to write this piece for Logistics & Transport NZ within my first fortnight as Minister of Transport. Coming into this role I am aware of the way in which our transport system touches the lives of all New Zealanders. It is a complex and interconnected system. As the new minister I am committed to continuing our work to plan for and invest in a truly integrated transport system across all modes, and to having an open ear to listen to all of the perspectives and ideas that you have.

I want to acknowledge that Covid-19 has disrupted the transport sector on an unprecedented scale. Maintaining our supply chain has been a priority during this time of global uncertainty, and CILT members and the wider industry have stepped up in a major way. I want to thank everyone involved in transport logistics for playing their part in keeping vital freight flowing, especially during lockdown. It can't have been easy, but thanks to you working with the Government, we were able to get essential goods like medicine and PPE to those who needed it most.

## Top priorities

Our Government's top priorities are keeping New Zealanders safe and accelerating our economic recovery from Covid-19. The team of five million has played its part and we're going to keep backing them with our strong plan that we started to roll out before the election. I'm proud to be part of our economic recovery team in Cabinet and I'm planning to keep backing our exporters, preparing for the future, and creating jobs.

One of the ways we're backing our exporters is through maintaining international connectivity. The virus caused a dramatic collapse in international flight numbers which are not likely to recover for some time. My officials and I are also closely monitoring the global seafreight supply chain as new challenges emerge. To preserve airfreight connectivity while flight numbers remain low and support our exporters getting goods to market, our Government-supported airfreight scheme has enabled over 3400 flights in and out of

New Zealand since April.

Recently, our Government extended the scheme through to the end of March 2021. This will not only help maintain critical air services with our trading partners, but it will ensure we have enough flights for New Zealanders wanting to return home and for essential workers on vital projects.

## Transitioning to zero carbon

Preparing for the future means ensuring a just transition to a zero carbon and climate-resilient economy and society. A focus for me this term will be reducing transport emissions. Transport accounts for about 20% of New Zealand's domestic greenhouse gas emissions. We've made progress by more than doubling investment in public transport and walking and cycling infrastructure, making record investments in our freight and commuter rail network, and installing climate change as a priority in the Government Policy Statement on Land Transport, which will mean future transport investments will be assessed against their impact on the climate.

But we know there is more to do, and I know the industry is also keen to decarbonise New Zealand's heavy vehicle fleet. I plan to partner with the industry on the Green Freight Project, which is focused on heavy vehicles carrying road freight and the role alternative green fuels could play in reducing emissions.

To support industry adopting low-emissions technology, we're looking at an extension to the current RUC exemption for heavy electric vehicles after 2025 and broadening the exemption to cover other low-emission power sources such as hydrogen. We're committed to working with the sector as a 'one size fits all' approach is unlikely to work, and it will need a mix of

Government intervention through measures such as building supporting infrastructure

and industry collaboration to transition to a low-carbon sector.

## Delivering on infrastructure

Creating jobs through delivering on infrastructure will be a key focus of mine. Through the New Zealand Upgrade Programme we're investing over \$6.8 billion in transport to save lives, get our cities moving, and boost productivity in the country's growth areas. The programme will play a vital role in our economic recovery, providing a pipeline of work for the construction industry and professional services sector for the next decade, and supporting thousands of jobs in those industries and the wider supply chain.

Progress has been made to develop all 20 projects this year, with 650 people already working on the programme; construction will begin in early 2021 on the first two projects, with more to follow later in the year.

A key upshot of our transport infrastructure plan is that it will improve freight connections which will help get goods to market more efficiently. Some key projects from the NZ Upgrade Programme include a new 22 km four-lane corridor from Whangarei to Port Marsden, the third main rail line in Auckland between Quay Park and Wiri, a four-lane corridor from Omokoroa to Tauranga, and improvements on SH76 to support a more reliable freight route to Lyttelton Port. This is on top of starting the Manawatu Gorge replacement highway, as well as completing the Waikato Expressway and Christchurch motorways this term.

There are still many challenges ahead in our economic recovery, but with the team of five million and our strong plan, there are plenty of opportunities to be taken as well. I'm looking forward to working with CILT NZ members and the wider sector to harness these opportunities and keep making progress rolling out our plan.



Michael Wood is the MP for Mt Roskill, the Minister of Transport and Minister for Workplace Relations and Safety, and Deputy Leader of the House under the new Labour Government

## OUTSTANDING ACHIEVEMENTS

# CILT NZ Awards 2020

## recognise excellence and innovation in a tough year

THE ANNUAL CILT NZ awards recognise outstanding achievements within the transport, logistics and supply chain sectors, and are made for the 12 months ending 30 June each year. This year has been particularly tough, with all businesses affected by Covid-19 disruptions and lockdown restrictions. This year's gala awards evening planned for October in Auckland could not go

ahead. Instead, two events were held: in Christchurch on Friday 6 November, and in Auckland on Wednesday 11 November.

CILT NZ thanks this year's sponsors of the awards: Abley, Dexion, DRD Consulting, Foodstuffs NZ, Logistics Training Group, MITO and Safety Made Simple.



(Above and below) The CILT Northern Awards evening was held in Auckland on Wednesday 11 November

### Awards judges

The awards are divided into three sections. The first section is for academic and research achievements, the second for communications and industry achievement, and the third for excellence. CILT NZ acknowledges the time and effort of Fiona Knight as the awards convenor and judge, and thanks the other awards judges:

former Young Achievers of the Year Simon Olsen, Ginny Christians and Elizabeth Anderson; last year's Rising Star Isabella Bennich-Wolter; Jeff Darby of Dexion; Rob Mayo of cOlab and Associates; Robin Dunlop from DRD Consulting; Dave Stewart of OJI Fibre Solutions; and CILT presidents Keith Robinson, Cormac McBride and Margaret Harris.





The CILT Southern Awards evening was held in Christchurch on Friday 6 November

## Awards for academic and research studies

From the institute's inception in 1919, its role worldwide has been a simple one – education. This set of awards acknowledges that role, with awards to a number of students who achieved excellence at their chosen levels.



Grant Arlidge from HW Richardson Group with Jodi McNamara, winner of the MITO/CILT scholarship, and MITO CEO Janet Lane



Walter and Tessa Glass of the Logistics Training Group, with top graduate award winner James Dyason

### The MITO/CILT scholarship for a graduate of MITO

Sponsored by MITO, represented by CEO Janet Lane

Recipient: JODI McNAMARA

The CILT and MITO scholarship is awarded to an emerging industry leader, one that has completed a MITO qualification within the road transport, logistics, ports or stevedoring sectors, to assist them with further professional development.

Jodi is a young road transport operator and works for HW Richardson Group (HWR). She wishes to further her career and pass on her experience to future up-and-coming operators. Having completed her Level 3 qualifications with MITO, she is now embarking on a Level 4 qualification (business skills) and plans to become a driver trainer within HWR. The judges agreed that Jodi is a truly self-motivated person with a willingness to help others achieve.

### Award for the Logistics Training Group's top New Zealand graduate in the CILT UK Professional Diploma in Logistics and Transport

Sponsored by the Logistics Training Group, represented by programme director Walter Glass

Recipient: JAMES DYASON

This award is made on the recommendation of the programme director for the student who has achieved the highest overall performance in the professional diploma in the previous academic year.

Walter says James was an outstanding and conscientious student. He was diligent and committed with a keen eye for detail. His ability to consistently produce a very high standard of work

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Cont. from page 5



Abley's Colin MacArthur with Nicolas Adams, winner of the award for outstanding research achievement for a master's dissertation or thesis

whilst undertaking a challenging role as operations manager at Prepack and juggling the needs of a growing family was impressive. James completed his studies well, achieving a 'distinction', and is a very deserving recipient of the 'top student' award.

**Award for outstanding research achievement for a master's dissertation or thesis**

Sponsored by Abley, represented by associate director Colin MacArthur

Recipient: NICOLAS ADAMS

This award recognises a dissertation or thesis submitted to a New Zealand tertiary education provider for a master's level qualification. The subject of the research must be in a field of transport, logistics, or supply chain, and the research is required to be original and innovative, demonstrating a clear potential to improve one or more elements in the chosen field of study.

The judges described Nicolas's thesis on the health economics of cycleways as 'excellent and provocative research' and 'should be professionally valuable while also being easy to read'. Already the judges are looking for ways to get the research promulgated more widely, including via CILT meetings and webinars.

**Awards for communications and industry achievement**

These awards acknowledge specific achievements within the transport and logistics industries.

**Communications Award**

Sponsored by CILT NZ, presented by CILT Southern Section chair Kris Lancaster

Recipient: CHRIS DANN

This award recognises the best published article, or a series of articles, in a New Zealand publication or the best presentation to a supply chain/logistics or transport forum, or a CILT meeting. This year's winner is Chris Dann, a partner of law firm Anthony Harper, and he is regarded as one of the country's leading transport and logistics lawyers. He is also a writer of articles which the judges described as very thorough! Chris has covered a wide range of topics, from how coronavirus has impacted the supply chain, unfair conduct business-to-business, international commercial terms, driverless vehicles and laws around drones.

The judges said Chris's articles presented complex but highly relevant questions in an easy-to-digest manner which allowed readers from all areas of the industry to engage with the material. These articles were a thorough but bite-sized analysis of the

issue, eminently suitable for the audience and publication they were targeted towards.

Chris was unable to attend the awards evening, and instead was presented with his award by Kris Lancaster the following week.

**The Dexion Award for Excellence and Innovation in the Transport and Logistics Sectors**

Sponsored by Dexion, represented by Jeff Darby

Recipient: ENVIRONMENT & CONSERVATION TECHNOLOGIES

This award recognises a project or initiative which addresses a challenge faced by an organisation in a unique way, and includes integrity in relationships and innovation in application. The judges noted that this was the most popular award this year judging by the number of entries, which says a lot for our Kiwi ingenuity.

The winning innovation represents 'out of the box' thinking and very much impressed the judges. When the Ecuadorian Department of Conservation wanted a cost-effective method of baiting invasive rats threatening the native flora and fauna on one of the



Chris Dann receives the Communications Award from CILT Southern Section chair Kris Lancaster



Sam Vye and Cam Baker of Environment & Conservation Technologies, winners of the Dexion Award for Excellence and Innovation



David Kriel and Dylan Turnbull from Port of Napier, winners of the Safety Made Simple Award, with CILT president and award sponsor Keith Robinson



Jason Garrett (left) and Martyn McColgan from Port of Tauranga – runners-up for the Safety Made Simple Award

Galapagos Islands, Mt Maunganui based Environment & Conservation Technologies (ETC) combined science with the latest technology to accurately lay 1.5 tonnes of bait over two days without setting foot on the island. The answer was the ETC team's heavy-lift drones, launched off the deck of a boat. This is 'last mile logistics' from the air. Their success and resulting publicity generated further work from New Zealand Government departments and NGOs, and further international contracts for ETC's conservation-oriented research and development business.

A video interview with Sam Vye and Cam Baker of ETC can be viewed on the CILT website at [cilt.co.nz/industry/dexion-innovation-award-winners-ect-of-tauranga/](http://cilt.co.nz/industry/dexion-innovation-award-winners-ect-of-tauranga/)

### The Safety Made Simple Award

Sponsored by Safety Made Simple, represented by Keith Robinson  
Recipient: PORT OF NAPIER

This award recognises innovation or best practice in health and safety in the transport and logistics sectors. Nominees must demonstrate how the innovation exceeds current legislative requirements, whether it is technology, systems or processes. To ensure the credibility of the judging, all three judges for this award are health and safety specialists in their own sectors.

There were two finalists for this award, and the judges commented that both were very credible nominations and deserved to be recognised for the innovative systems they have implemented

to create a safer environment for personnel working in their specific work areas. Interestingly, both finalists are port companies.

Port of Napier was the winner. The judges considered their management systems to be very robust and involved several different parties during the process of initiating an outcome that would enhance the safety of all personnel. It involved near-miss reporting, health and safety committees, line managers, consultants, and different transport companies to arrive at their solution.

Port of Tauranga received a Highly Commended award for developing an individualised solution to manage a critical risk and the use of innovative technology to do this.

### Rising Star Young Employee of the Year

Sponsored by DRD Consulting, represented by Dr Robin Dunlop  
Recipient: MEGAN CROW

This award recognises a young employee (under 35) in the transport and logistics sectors who embodies the mission of their employer, consistently produces quality work, and displays characteristics that are valued by their peers and colleagues, as well as managers.

This year's winner impressed the judges, especially Isabella Bennich-Wolter, last year's winner, who was also part of the judging panel. The judges said that Megan, a transport supervisor at C3, has an outstanding work ethic and approaches her work professionally and meticulously, often a rare quality in

Cont. on page 8



Kevin Bird from C3 with Rising Star Young Employee of the Year Megan Crow



Bradley Rose from Foodstuffs South Island, Rising Star Young Employee of the Year runner-up, with Isabella Bennich-Wolter, last year's winner

### Cont. from page 7

employees her age. She takes pride in delivering safe, successful outcomes on a daily basis, and has been integral in transforming the branch into a modern, efficient logistics division.

One of C3 drivers commented on Megan's constantly positive attitude, saying her pure zest for work is contagious, inspiring even the grumpiest driver to do better. She soaks up each new job, fine-tunes it and makes it easier for the drivers. And she does the same

for clients: one customer states that she cares about their team and their operation, and her professional approach to everything she does is a credit to her employer.

Runner-up for this award was Bradley Rose from Foodstuffs South Island. The judges agreed that Bradley not only demonstrates wide technical knowledge, but also excellent presentation skills and change management skills, and has the ability to communicate with people at all levels – and he is only 27!

## Awards for excellence

The following awards are only made to those individuals of the very highest calibre.



John Mullins with Young Achiever of the Year Joshua Bates



Sidney Nasson, service line leader transport planning at WSP Auckland, and Nerissa Harrison, principal transport planner and team leader at WSP Auckland, accept the award for runner-up in the Young Achiever of the Year on behalf of Shifani Sood

### Young Achiever of the Year

Sponsored by Foodstuffs NZ, represented by John Mullins

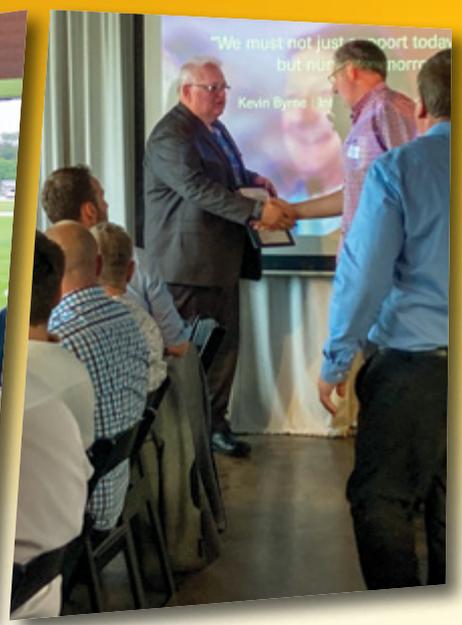
Recipient: JOSHUA BATES

The purpose of this award is to provide incentive for and recognition of young achievers who are actively involved in the day-to-day operation and development of transport and/or logistics in New Zealand. The prize for this award in the past has been the opportunity to attend the CILT International Conference, but sadly Covid-19 has put paid to that. The next one is scheduled for 2022. Instead, CILT and Foodstuffs as the sponsor have agreed to transfer the prize money towards training and development. Tonight's win-

ner and the runner-up will both receive \$2000 towards training and development fees. Like the Rising Star award, the judges admitted that it was very close.

This year's winner is Joshua Bates, South Island regional sales manager for Crown Equipment. Still in his twenties, the judges said Joshua demonstrates excellent communication skills with staff, colleagues and clients. He drives change management and is committed to staff training, including for people much older than himself. He turned around an underperforming team and is a role model for health and safety.

Shifani Sood of WSP was this year's runner-up, and she also



impressed the judges with her leadership and communication skills. Colleagues, managers and clients consistently reported on her aptitude for communicating and bringing people together on challenging transportation projects. Shifani is described as a natural leader and has demonstrated her drive to share her knowledge through publications of thought leadership content and the delivery of webinars for national and global colleagues.

community and other organisations, and is not necessarily made every year. CILT NZ welcomes information in confidence that might help determine future awards for this top honour. Candidates cannot self-nominate.

It is the tradition that any recipient is completely unaware of his/her recognition and is surprised on the night of the awards dinner. And so it was this year. Walter told the South Island evening attendees that it is rare in any corporate entity, let alone the world of logistics and supply chain, where a leader emerges who not only challenges him or herself with the test of self-development and education, but then fully supports the same opportunities for their staff. This year the recipient of the Sir Bob Owens Award is such a person and a very strong proponent of management education and leadership skills development.

John Mullins is the general manager supply chain for Foodstuffs South Island. In supporting the learning and development of his staff, John provides an environment for people to expand their knowledge, as well as in their competence and capability. Attitude rubs off on senior staff who, in turn, inspire a similar legacy in the people they lead, Walter said, and so John's leadership style will see his influence live on for many years.

John studied at Massey University over 25 years ago, receiving the CILT Professional Diploma in Logistics and Transport. He excelled in his study and was promoted to the senior leadership role of distribution manager. Hailing from the South Island, he is an icon in the fast-moving consumer goods sector, and highly respected by industry and colleagues alike. He has been a keen sportsman over the years and now, we understand, is soon to take a bit of R&R – although Walter is certain he will continue to impart sage advice on a regular basis.

The Norman Spencer Memorial Medal for Contribution to Transport and the Institute was not awarded this year. A memorial to Norman Spencer, the first chairman of the New Zealand division of the Chartered Institute of Transport, which was founded in 1919, the award recognises a person of the highest calibre from within the transport and logistics sectors. Past living recipients of the Norman Spencer Memorial Medal receive a miniature pin of the medal that can be worn along with the CILT pin and other awards and decorations.

*For further information on the awards, the categories and how to nominate someone or an organisation, visit [www.cilt.co.nz](http://www.cilt.co.nz)*



John Mullins receives the Sir Bob Owens Award for Outstanding Contribution to the Logistics, Supply Chain Sector and Community from CILT NZ president Keith Robinson

**The Sir Bob Owens Award for Outstanding Contribution to the Logistics, Supply Chain Sector and Community**  
Presented by Walter Glass, Logistics Training Group, and Keith Robinson, CILT NZ president

Recipient: JOHN MULLINS

This award is a memorial to the late Sir Bob Owens, one of the industry's most respected leaders. Sir Bob was the founder of both the Owens Group and the Logistics Management Association, a former winner of the Norman Spencer award, and very active in local body politics, including the then local harbour board. The award was created by the former Logistics Management Association to commemorate Sir Bob's achievements, but was not awarded until after the merger with the Chartered Institute of Transport.

It remains the pre-eminent award for CILT NZ and is only made to a person who has made an outstanding contribution to the supply chain/logistics sector, as well as contributing to the com-

PROFESSIONAL DEVELOPMENT

# Supply chain practitioners — students for life

By Dr Carel Bezuidenhout

The recent influx of Kiwis back to the shores of New Zealand as a result of the Covid-19 outbreak has ramped up competition in the supply chain practitioner job market

**MOST SUPPLY** chain practitioners love their jobs. A recent survey conducted by Massey University shows a job satisfaction rating of 73% across a wide range of New Zealand’s supply chain practitioners. This rating went up during the Covid-19 lockdown crises, suggesting that good supply chain practitioners have a natural love of problem-solving and facing difficult challenges.

Supply chain and logistics practitioners work across a vast range of organisations, ranging from space agencies to large industries, daily postal services and health care. Each of these industries requires different skill sets. Sometimes people need to be good negotiators, others work under fast-paced time-demanding conditions, and some practitioners may end up in war

zones, disaster-struck areas or remote locations, like Scott Base in Antarctica.

It is impossible to list an exact set of competencies that a supply chain practitioner needs to obtain in order to be good at their job. The supply chain practitioner is often the integrator, pragmatically bringing together the physical world, business principles, people, information technology and regulations. It is not surprising that successful supply chain practitioners are always busy learning something new. It is also not surprising that many people only realise the significance of this career during a later stage in life.

**Core competencies**

Tertiary educators who strive towards preparing well-rounded individuals for the

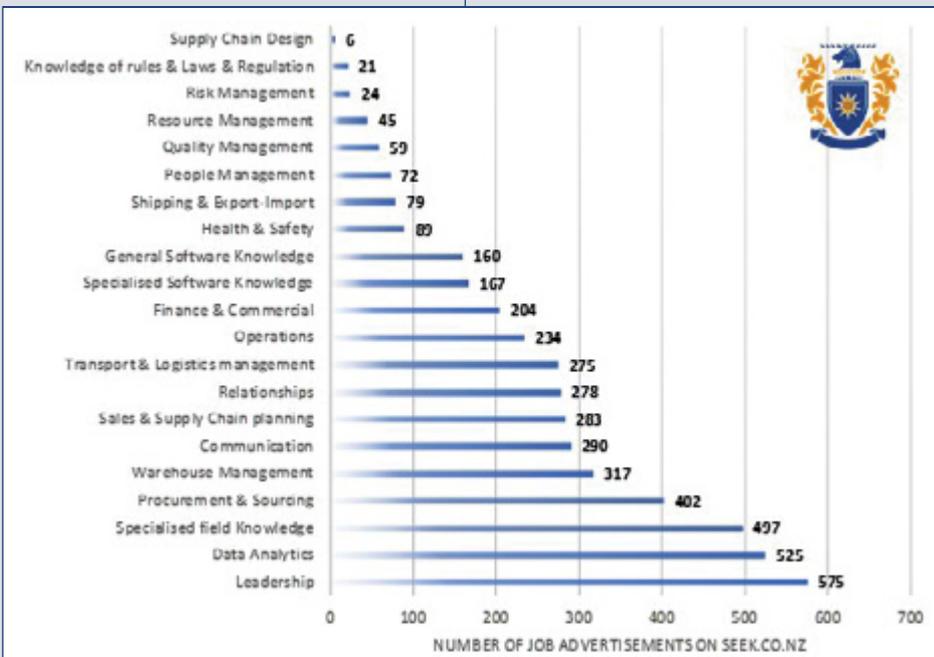
workplace face many challenges when incorporating all the important competencies into an academic curriculum. Earlier this year, Avadhesh Chandak, a Massey University master’s degree student in supply chain management, analysed more than 400 supply chain and logistics related job advertisements that were posted on the seek.co.nz website since the start of the year.

Twenty-one overarching competency areas were identified, with a frequency analysis indicating the number of times that a certain competency area was advertised. The diagram (left) illustrates the relative demand for different competency areas advertised during the first half of 2020.

Two supply chain practitioner reviews were carried out by Massey University amongst current supply chain specialists in 2020; one was in March, shortly before lockdown, and a second in September. Another two surveys were carried out amongst the country’s recruitment agencies, who regularly have exposure to new job entrants and employers who are demanding specific skills.

Competencies that relate to leadership appear to be in significant demand. This includes, amongst others, the need for candidates with experience in strategy development and cross-organisational relationship management. Employment agencies echoed this, stating that candidates who have experience in leadership have a significantly better chance during interviews.

The recent influx of Kiwis back to the shores of New Zealand as a result of the Covid-19 outbreak has ramped up competition in the supply chain practitioner job





Over the past six months, approximately 20% of those advertising for supply chain practitioner positions could not find a suitable candidate

market. Kiwis returning from overseas are bringing back vast levels of experience and knowledge that could easily result in a step-change in New Zealand's supply chains over the next few years. Employment agencies who have exposure to similar markets in other countries tell us that New Zealand's supply chain practitioners are currently still less specialised and more generalist in their approaches.

### Key findings

Over the past six months, approximately 20% of those advertising for supply chain practitioner positions could not find a suitable candidate. On the other hand, almost a third (30%) of employers reported that they found a perfect match and were very satisfied with the candidate who was appointed. In 12% of the appointments, the candidate managed to negotiate a higher salary package.

Almost two-thirds (60%) of employers believe that they stand the risk of losing some of their employees if a more competitive salary package is offered elsewhere. This points to a competitive space where supply chain practitioners with the correct range of competencies could easily negotiate a strong employment opportunity for themselves.

Covid-19 has impacted the landscape: Massey's surveys indicate supply chain practitioners have experienced a 24% decline in job security since early March. Also, promotion opportunities reduced by 11% and alternative job opportunities declined by 19%.

Employment agencies list the following competencies as hard to find:

- Leadership
- Warehouse management
- ERP (enterprise resource planning) software
- Speaking a specific second language (often Chinese)
- Transport/logistics management
- Supply chain project managers
- Demand planning
- Critical thinking and problem-solving
- EQ (emotional intelligence)



Competencies that relate to leadership appear to be in significant demand

- Tertiary-level learning
- Being able to influence across business
- Competent in English – verbal and written
- Procurement
- Category managers
- Supply and demand planning
- Building professional relationships
- Material planning.

In summary:

- ▲ Job satisfaction amongst supply chain practitioners is high
- ▲ High chance that specialist expertise will get you the next job
- ▼ More competition in the job market due to returning Kiwis from abroad
- ▲ Good chances that New Zealand supply chains may become more efficient and specialised in the near future
- ▲ Good opportunities for candidates to negotiate better salary packages
- ▼ Fewer job opportunities available
- ▼ Internal promotion opportunities are lower
- ▼ Job security is lower.

*Massey University continuously carries out research concerning the supply chain practitioner profession. If you are interested in updates of this research, please register your interest with the author*



*Dr Carel Bezuidenhout is a senior lecturer in supply chain management at the School of Food and Advanced Technology, Massey University; he can be contacted at [c.bezuidenhout@massey.ac.nz](mailto:c.bezuidenhout@massey.ac.nz)*

## Send us your feedback

CILT NZ wishes to encourage debate about the articles included in this magazine.

Do you have an opinion or would like to submit feedback? A selection of commentary (along with the sender's name) will be included in the next edition, subject to space.

Email Murray King ✉ [murray.king@xtra.co.nz](mailto:murray.king@xtra.co.nz) before

Friday 26 February 2021, the deadline for the next edition.



## NEW ZEALAND'S PORTS

# Port Otago — a rich history of primary exports

Reported to Lynne Richardson

All photos courtesy of Port Otago

A ship leaving the Otago Harbour – Port Otago is the South Island's principal primary export port

**PORT OTAGO** is located on the Otago Harbour of the South Island of New Zealand. It is the South Island's primary export port and operates two wharf systems – Port Chalmers and Dunedin – within Otago Harbour. Port Otago benefits from a deep natural harbour, its strategic location for vessel rotation to and from deep-sea destinations, and a large primary export cargo region.

Owned by the Otago Regional Council, Port Otago has a rich and diverse history. The very first shipment of frozen meat from New Zealand left Port Chalmers, bound for London, in 1882. Some 90 years later, in 1970 the Port Chalmers container terminal was established, and the first container ship left Port Chalmers the following year.

The port company's principal role is to facilitate trade for the region's exporters and importers, and it has a significant impact on the economic, social and environmental wellbeing of Otago and Southland. The region has the infrastructure required for a successful port, including a fit-for-purpose road and rail network and a well-developed warehouse and cool

storage sector.

Port Chalmers is located in the lower harbour. With a channel depth of 13.5m, it can accommodate vessels up to 360 m long and has three berths, suitable for handling containerised, multipurpose, log carriers and cruise ships. Berthing flexibility is guaranteed by a swinging basin dredged to 13.5 m, with a turning diameter of 487 m.

The Dunedin Bulk Port is situated in the upper harbour, with a channel depth of 8.5 m. Tankers, fishing vessels, bulk carriers and smaller vessels are the principal users, with a maximum vessel length of 180 m. Six berths are available, with the main products being fertiliser, fish, logs, oil and LPG. The wharves are adjacent to cold storage facilities (which service the meat, dairy, fishing and horticultural exports of the region).

### Container trade

Port Chalmers is one of New Zealand's two deepest container ports and services some of the largest container ships in the country's trade. It can store more than 7000 containers and has the highest number of reefer (refrigerated container) points of any



Kevin Winders, Port Otago chief executive (left) and Paul Rae, Port Otago chairman

New Zealand port, with 1850. Container throughput for the last season was 191,900 TEU (20 ft equivalent units).

Ships are serviced by two ZPMC cranes and a fleet of Kalmar straddles and side loaders. The principal exports are chilled and frozen meat, apples and fish, along with milk powder and MDF/timber, both of which are packed in Port Otago warehouses.

The company has more than 38,000 sq m of covered warehousing at Port Chalmers, built to the high standards required by the dairy industry. It also has two wharfside cold storage facilities in Dunedin, able to hold up to 10,500 tonnes of frozen product. This is used primarily to service fishing customers.

"We offer customers the option to book rail services from Southland and South Canterbury, which provides our customers and partners with cost-efficient options to transport their goods," explains Craig Usher, Port Otago commercial manager. "We are a long way away from most markets and continuing to provide a high level of service and product offerings is key."

### Technological innovation

Keeping their team safe and ensuring they meet customers' expectations around safety is essential at Port Otago. "One of

Logs are a principal export commodity – there is approximately 7 ha of log storage area available between Port Chalmers and Dunedin Bulk Port





Port Chalmers is one of New Zealand's two deepest container ports and services some of the largest container ships in the country's trade



Keeping their team safe and ensuring they meet customers' expectations around safety is essential at Port Otago

the many safety initiatives we have implemented in recent years is our tip alert software that records and shares information on straddle carrier tip alerts," says Mr Usher.

"The potential for a 60 tonne straddle carrier to tip over and kill or seriously injure someone is a very real risk. Previously, manufacturer sensors alerted drivers if they breached a stability threshold, based on speed, turning radius and spreader height/weight. However, the alert was only heard by drivers in the straddle cabs."

The software installed in the company's 15 straddle carriers in May 2018 automatically records and shares the tip alert data with shift supervisors. Red tip alerts – the most extreme alert level – dropped from 350 alerts per week to less than five per week in 2018/19. This low level of alerts has continued into 2020. "The impact of this safety measure is so dramatic that the default metric is now the more positive 'average alert-free days per month'. Alert-free days did not exist two years ago. Now, the average number per month is 17," Mr Usher says.

In 2020, Port Otago developed a vehicle booking system (VBS). Previously, trucks would arrive at any time to drop off or

pick up cargo, but the new VBS allows Port Otago to smooth out truck arrivals. With about 1000 containers passing through Port Otago facilities each week, the upsides for the company are more efficient use of machinery, better coordination of container movements, and managing truck queues on public roads.

For trucking companies, the system minimises time spent queuing to access a port site. The new booking system also improves community safety, by avoiding queues of trucks forming. In the past, these queues have, at times, congested Port Chalmers' George Street and main intersection. There are three VBS kiosks at Port Chalmers and one at Dunedin Depot. The Dunedin Depot kiosk was the first to be installed and the peak truck turnaround time has dropped from 30 minutes to less than 10 minutes.

### Cruise ships

Port Chalmers is the primary South Island port for cruise ships and generally the port of call for ships immediately before or after visiting Fiordland. Prior to the Covid-19 pandemic, cruise ship numbers were increasing year-on-year. The 138 vessels booked for the 2020/21 season were

expected to contribute more than \$60 million to the local economy. This aspect of the business is currently on hold, with ships being temporarily banned from entering New Zealand waters as part of New Zealand's response to the pandemic.

### Bulk business

Port Otago is renowned for its bulk business, with principal commodities being logs, oil, fish, cement, LPG and fertiliser. The port company currently utilises storage and berths in both Port Chalmers and Dunedin Bulk Port. There is approximately 7 ha of log storage area available between both sites.

"The use of rail is often talked about. However, due to the close proximity of the two ports either side of us, our customers' view is that once product is on a truck, then it is best to go direct to port," notes Mr Usher.

In the financial year ending June 2020, 1.5 million tonnes of bulk cargo went through the port. This included 890,000 JAS of export logs (the Japanese Agricultural Standard cubic metre, or JAS, is a global industry standard measurement of log volume). Currently, the main fumigation chemicals are methol bromide for logs travelling on deck and phosphine for logs underdeck (a 10-day process). Export forestry products account for 94% of the methol bromide use in New Zealand. From 28 April 2021, recapture technologies or another approved product must be used. The Ministry for Primary Industries (MPI) has submitted research of ethanedinitrile (EDN) to key trading partners for assessment.

### Property

Port Otago owns property in Dunedin, Hamilton and Auckland, and this is managed through a property-focused division. Its core activity is commercial property investment. The company manages its investment portfolio through active

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Port Otago leadership team (L-R): Kate Walton, Craig Usher, Jodi Taylor, Deanna Matsopoulos, Kevin Kearney, Kevin Winders, Gavin Schiller, Sean Bolt, Stephen Connolly, David Chafer



From Taiaroa Head to the container terminal at Port Chalmers, the harbour is dredged to accommodate vessels with a maximum draught of 13.5 m

**Cont. from page 13**

acquisition, property development and, at times, divestment to produce a diversified portfolio by property type and location.

Port Otago’s property arm makes a significant contribution to its long-term financial sustainability and will remain an important part of the company’s balanced portfolio.

**Embarking on a sustainability journey**

Kevin Winders, Port Otago chief executive, says that as an organisation, Port Otago has been working towards a strategy for a better business. “In 2020, we embarked on ‘Integrated Thinking’, starting with a materiality process to understand what matters most to our stakeholders and the business.

Value is measured in more than just dollars. Instead, we are now using internationally recognised ‘six capitals’ to communicate resources used and value created. We refer to these capitals within our organisation as: our team, our wider team, our harbour and beyond, our know-how and skills, our assets and our financial value,” he notes.

“This has been a pivotal year in the port’s sustainability journey. We completed our first materiality process and have developed our value chain thinking considerably. Now that we understand what is most important to our stakeholders and the port – alongside how we create and preserve value – we are working on our goals. These goals will make up our strategy for a better business, which we look forward to sharing with everyone.”

**Port Otago leadership team**

- Kevin Winders – chief executive
- Stephen Connolly – chief financial officer
- Sean Bolt – general manager, marine
- David Chafer – general manager, property
- Kevin Kearney – general manager, operations
- Deanna Matsopoulos – supply chain manager
- Gavin Schiller – head of safety
- Craig Usher – commercial manager
- Sandy Shea – general manager, information technology
- Kate Walton – people and capability manager
- Jodi Taylor – executive assistant.

worked with other maritime and airline organisations, including Ports of Auckland, South Port, the Australian Maritime Safety Authority and several Australian ports. Dr Thomas has been appointed to review the port’s fatigue policy and rostering and training, in relation to the port’s fatigue risk profile for its operations.

With safety its primary benefit, TimeTarget software helps Port Otago’s workforce planners manage the risk of staff fatigue. Data is being analysed and rules around maximum working hours and minimum shift breaks applied. TimeTarget also improves transparency around shift work – a feature appreciated across the team. A fatigue working group was formed during the year, made up of representatives from the Maritime Union of New Zealand, the Rail and Maritime Transport Union, the port’s people and operations teams and Dr Thomas. This working group meets monthly and one of its critical tasks is designing a fatigue risk management system for Port Otago.

**Port Otago quick facts**

- 319 employees as at 30 June 2020
- 476 container and bulk ships piloted through Otago Harbour in the last season
- 191,900 TEU container throughput in the last season
- 204,000 cruise passengers visited Dunedin during the 2019/2020 season
- 73,899 gross tonnage – the size of the largest container ship to visit Port Otago.

**Port Otago team**

Taking steps to reduce fatigue is a key focus for the port company for 2020/21. In the past year, significant initiatives were actioned: a new roster system was rolled out company-wide; a fatigue risk management system and working group were created; and a fatigue expert was appointed.

Dr Matthew Thomas is one of Australia’s leading experts in safety management in high-risk work environments. He has



A busy day at the port, with a double cruise ship visit and the Taieri Gorge train alongside, picking up customers for a day excursion, while a container ship is worked in the background



Lynne Richardson is the former editor of FTD and NZ Construction News magazines

## TOLL ROADS

# Assessing and forecasting demand and revenue for toll roads in New Zealand

By Neil Douglas and Tony Brennan

New Zealand currently has three toll roads in operation, including the Northern Gateway north of Auckland which was opened in 2009

**SIXTY YEARS** ago, in 1959 (an auspicious year for one of the authors), the Auckland Harbour Bridge opened with a toll of two shillings and sixpence for cars (25 cents). Some 11,205 vehicles crossed the 1.2 km bridge. With 23-fold inflation, the toll in 2020 would be \$5.77 for cars and motorcycles and \$11.54 for HGVs and buses. With 170,000 vehicles using the bridge per day, 2019 revenue would probably be around \$300 million (including GST) after allowing for some toll aversion. Such an amount would certainly be welcomed by Waka Kotahi NZ Transport Agency to help them fund the transport projects needed to meet the city's increasing population.

However, as with the Tauranga Harbour Bridge (tolled for 13 years between 1988 and 2001), the toll was removed in 1984 when the \$15 million construction cost (\$347 million in 2020 dollars) was paid.

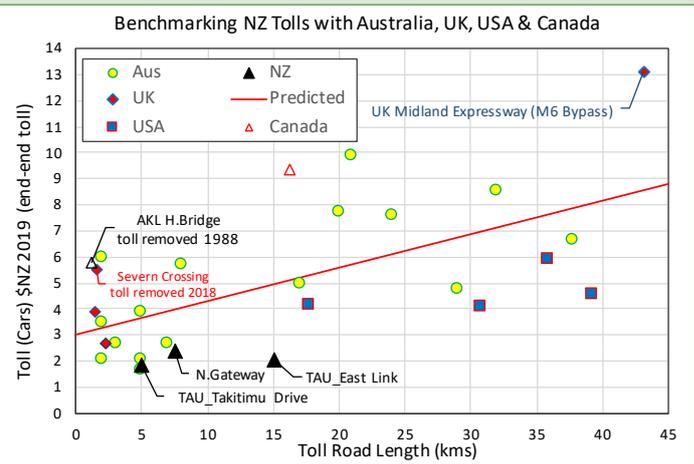
By contrast, the Sydney Harbour Bridge is still tolled (south-bound) despite paying the construction cost several times over. The toll was first retained to pay for a harbour tunnel and then, when that was paid, it was retained as a source of state revenue (since most taxes and charges are levied federally) and as a demand management 'tool' (\$4 peak, \$2.50 off-peak).

## Current toll roads in New Zealand

In 2020, three toll roads operate in New Zealand. The Northern Gateway north of Auckland was the first to be opened in 2009. The 7.5 km road extended the motorway from Orewa to Puhoi, bypassing the seaside towns of Orewa, Hatfields Beach and Waiwera, and in so doing cutting the drive time by 10 to 25 minutes.

Two Tauranga toll roads started operations mid-2015. The 5 km Takitimu Drive bypasses the city centre on the northern side, taking traffic off SH19 to SH2 in the direction of the Port of Tauranga and Mt Maunganui. The Tauranga Eastern Link, costing \$455 million, runs for 21 km between Papamoa and Paengaroa, of which 15 km is tolled, and provides an alternative to driving through Te Puke when travelling between Tauranga and Rotorua or the East Cape.

The tolls set on the three toll roads are low by international standards. The Northern Gateway charges \$2.40 for cars and light commercial vehicles (LCVs); the Tauranga Eastern Link charges \$2.10 and Takitimu Drive \$1.90. Motorcycles pay the same as cars. Heavy commercial vehicles (HCVs), including buses, pay double the car toll on the Northern Gateway (\$4.40) and around two-and-a-half times more on the Tauranga toll roads.



Tolls in Australia (for eight roads in NSW, six in Queensland and two in Victoria) are twice as high as New Zealand. In the UK, tolls on the Dartford Tunnel and Humber Bridge and, up until 2018, the Severn Crossing, range from \$2.60 to \$5.50. The only major road toll in the UK is the Midland Expressway which bypasses the M6 for 43 km around Birmingham. The end-to-end car toll is \$13.

Mainland USA has 77 toll roads (excluding managed lanes, bridges, tunnels) with 25 in Florida and 24 in Texas. As examples, three suburban toll roads in Florida, California and Illinois plus an orbital toll in Texas are plotted on the graph. The US tolls are higher than New Zealand, reflecting longer distances, although the rate per km is similar. In Canada, the Montreal 407 has a toll of \$9.40 for a 16 km trip.

Combining the data gives a flag-fall toll for cars of \$3.13 per kilometre. If the formula was applied to the nearly completed 26 km Transmission Gully highway out of Wellington, it would be \$6.50 for cars, LCVs and motorcycles and \$13 for HCVs. It compares with \$2.50 if based on the three New Zealand toll roads.

Unlike Australia, all New Zealand toll roads are government operated. Tolls have been increased with inflation. For the Northern Gateway, the car toll has increased just 40 cents in 10 years: from \$2 to \$2.40. By contrast, Transurban in Australia has increased tolls considerably more than inflation. For example, the car toll for the M2 in Sydney rose 6.6% a year from AU\$5 in 2013 to AU\$7.83 in 2020.

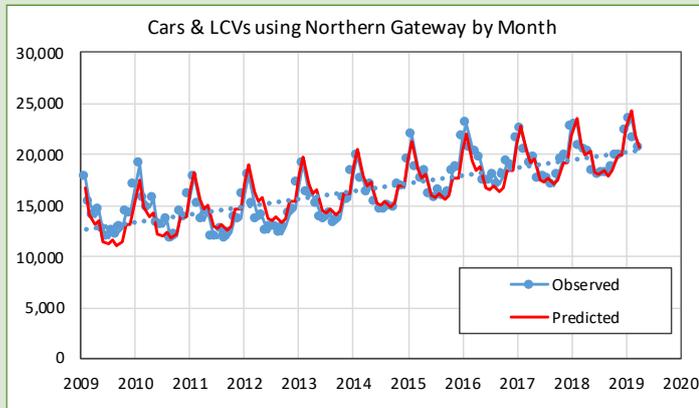
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**Revenue and vehicle ramp-up**

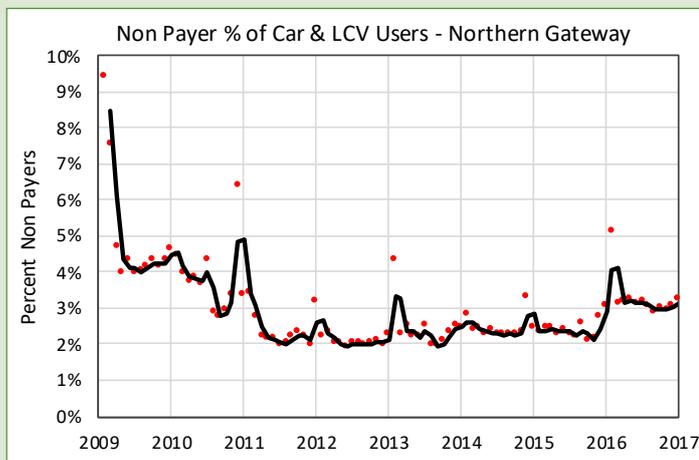
An area of interest to toll forecasters and financiers is the extent to which demand should be reduced for ‘ramp-up’ during the early months/years of a toll road’s operation. There has been little published research, however. A 2011 Australian review by Davidson (‘Modelling Toll Roads – Where Have We Gone Wrong?’ for the Australasian Transport Research Forum) concluded that ramp-up dampened demand by 30%, with full demand achieved after two years. However, no evidence was cited, and it could be that Davidson’s conclusion was ‘industry conventional wisdom’.

The three New Zealand toll roads use electronic toll collection which has allowed the build-up in pre-pay registration and revenue growth to be assessed, as well as vehicle numbers. The data shows revenue ramp-up to be more pronounced than vehicle ramp-up. Indeed, for the Northern Gateway, time-series regression shows no evidence of vehicle ramp-up, as can be seen in the graph. Traffic grew linearly (i.e. not compounded) at around 9000 vehicles a year (4.6% per annum).



For Tauranga, car, LCV and HCV traffic was 8.5% down in the first three months for Takitimu Drive and 6% down for the Eastern Link. There was no evidence of ramp-up for motorcycles.

There was greater revenue ramp-up due to non-payment as the electronic system bedded in. For the Northern Gateway, non-payment started around 8% then dropped to 4% within four months and to 2% after two years. The profile was similar for HCVs. Motorcycles weren’t tolled for the first 18 months, and when a toll was introduced, 22% of motorcyclists didn’t pay initially, with the percentage declining to 10% after six months.



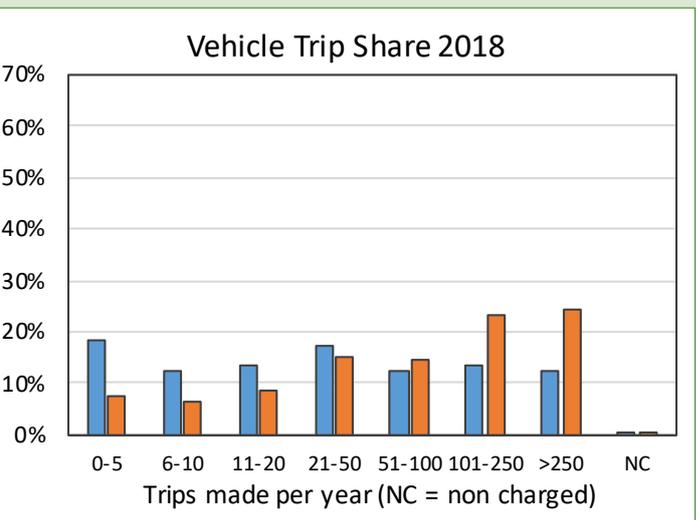
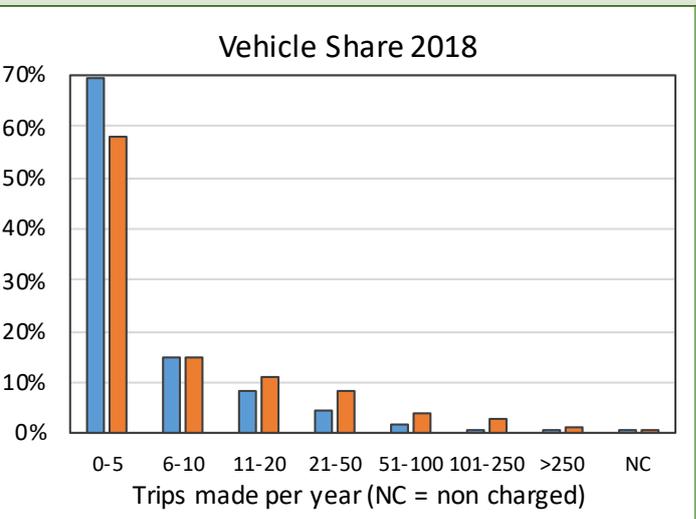
Revenue ramp-up was less for the Tauranga toll roads. There was zero ramp-up for cars and LCVs and only 2% greater non-payment by HCVs during the first four months of operation. Non-payment for motorcycles was higher, with half of Takitimu Drive users not paying at the outset. The share then declined to a third after four

years. For the Eastern Link, non-payment has remained relatively constant at around one in five of motorcyclists.

**Toll road usage**

Cameras using optical character recognition read the front and rear registration plates of vehicles. A registered owner lookup permits non-registered vehicles to be issued a toll pay notice (which includes an administration fee of \$4.90). The data collected enables the use by individual vehicles to be categorised by frequency of use.

For 2018, 70% of vehicles using the Northern Gateway used the toll road less than six times, reflecting its ‘holiday’ status, whereas for the two Tauranga toll roads, the share was 58%. When weighted by trips, the shares dropped to 18% and 7.5%. Infrequent users still accounted for most trips for the Northern Gateway, but for Tauranga, nearly half the vehicles made over 100 trips a year, reflecting relatively higher commuter and business usage.



Over the decade 2009–2019, 3.7 million different vehicles used a toll road, which compares with 4.1 million vehicles registered in New Zealand in 2017. The average vehicle made 23 trips. The database also allows the geographic origin of registered vehicles to be determined. As at September 2019, there were 196,600 live accounts. One half (148,000) were in the Auckland region, a quarter in the Bay of Plenty and a fifth in Northland/Waikato. Around 7% were spread across the rest of the country with 1% registered overseas (mainly Europe, 1000, and Australia, 550).

Analysing the database before and after the opening of the Tauranga toll roads in 2015 enables a gravity model to be fitted to the registration data. Regional registrations per capita were



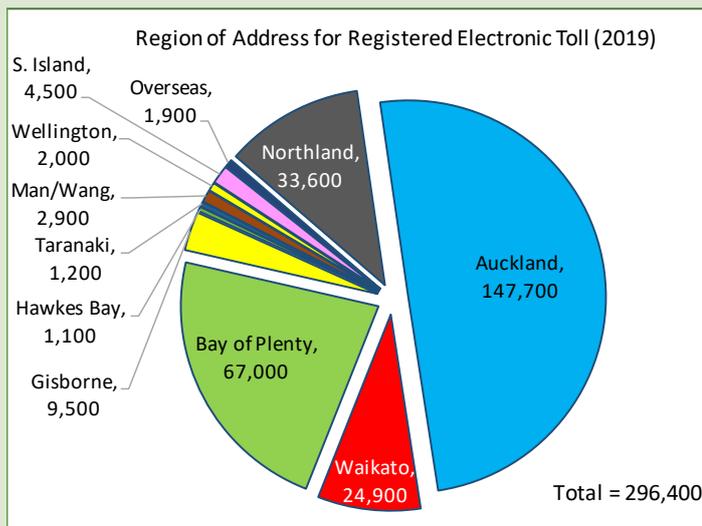
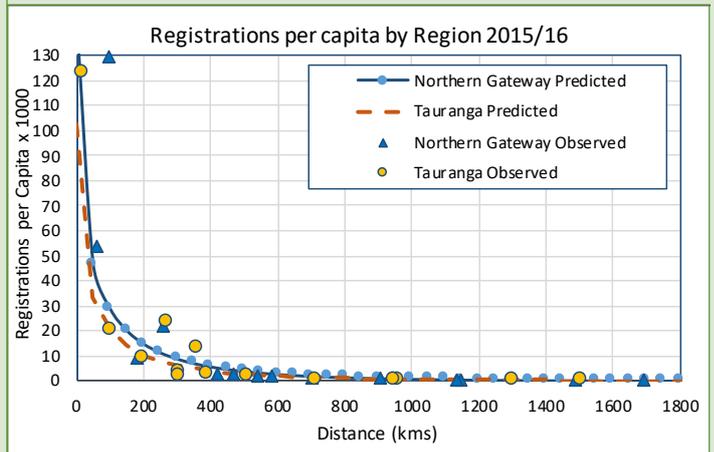
The Tauranga Eastern Link under construction – costing \$455 million, the road runs for 21 km between Papamoa and Paengaroa, of which 15 km is tolled

regressed against road distance. Distance was measured for each toll road to the main centre of each New Zealand region. The square root of the road kilometres was then taken and the natural logarithm of registrations/capita as these transformations produced the closest fit to the steep distance decay.

The Northern Gateway was distinguished from the two Tauranga toll roads which produced 28 observations. The same distance parameter was appropriate (-0.16) with the Northern Gateway having a modestly larger constant (4.98) than the Tauranga toll roads (4.63) indicating higher registrations per capita, other things being equal.

As a worked example, the model was used to predict toll registrations for Transmission Gully. Registrations were forecast to increase by around 62,500 (an increase of just over 20% on 2019 registrations). Two-thirds were in the Wellington region and one-third across the rest of New Zealand, with just over 400 additional overseas registrations. Assuming the existing 'national' ratio of toll road use to registration, Transmission Gully vehicle traffic would

total 3.3 million trips and generate revenue of \$9 million adopting charges of \$2.50 for cars, LCVs and motorcycles and \$5 for HCVs.



**Conclusion**

New Zealand has three toll roads that set low tolls roughly half those of Australia. Demand ramp-up over the first months and years of a new toll road has been an under-researched area. Analysis of Waka Kotahi NZ Transport Agency (NZTA) toll data found revenue ramp-up was more pronounced than vehicle ramp-up. Use of registration data to profile toll road demand has not been published to date. NZTA's database has enabled frequency of use and the geographic distribution of toll road users to be profiled. A simple gravity model using regional population and distance was successfully fitted and then used to predict the increase in registrations, vehicle demand and revenue for a new toll road.

The electronic toll system has now been in operation for over a decade and has been widely taken up by the driving population. The system is readily extendable to fund transport infrastructure and better manage demand on New Zealand's busy roads.



Neil Douglas has a PhD in economics from Leeds University and is an independent consultant, a fellow of CILT, the newly elected president of the Australasian Transport Research Forum, and chairperson of the Wairarapa Tree Crops Association; Tony Brennand is a chartered member of CILT NZ and is a transport planning manager at Waka Kotahi NZ Transport Agency. The authors acknowledge the skills of Nicola Will of NZTA without whom this paper would not have been possible. The views expressed are those purely of the authors and do not intend to reflect those of NZTA in any way

## SHIP BUILDING

# Expanding mercy – Mercy Ships nears completion of the MV *Global Mercy*

By Janine Stewart and Irene Kim

The hospital ship *Global Mercy* will provide free services to more than 150,000 people in Sub-Saharan Africa over the vessel's expected 50-year service

**RESEARCH HAS** continuously emphasised the increasing need for medical and surgical care around the world, especially in Africa. More than 5 billion people worldwide do not have access to safe surgeries, and now with the impacts of Covid-19, the global backlog of surgical care has escalated. Along with the *Africa Mercy*, the *Global Mercy*™ will change numerous lives by providing free essential surgery, medical training and mentoring, all of which will significantly impact the healthcare capacity of the Sub-Saharan region.

## About Mercy Ships

Mercy Ships uses hospital ships to deliver free, world-class healthcare services, capacity building, and sustainable development to those with little access in the developing world. Founded in 1978 by Don and Deyon Stephens, Mercy Ships has worked in more than 55 developing countries, providing services valued at more than NZ\$2.55 billion and directly benefitting more than 2.84 million people. The ships are crewed by volunteers from over 60 nations, with an average of more than 1200 volunteers each year. Professionals including surgeons, dentists, nurses, healthcare trainers, teachers, cooks, seamen, engineers, and agriculturalists donate their time and skills. With 16 national offices and an Africa bureau, Mercy Ships seeks to transform individuals and serve nations.

[www.mercyships.org.nz](http://www.mercyships.org.nz)

The recently constructed *Global Mercy* is the world's only non-governmental purpose-built hospital ship. At 174 m in length, 7000 sq m in area and 37,000 gross tonnage, it is twice the size of the *Africa Mercy*, a former passenger ferry which was acquired by Mercy Ships in 1999 and refurbished specifically as a hospital ship to serve surgery and health needs in Africa. Now in 2020, the newly constructed *Global Mercy* is nearing completion to further expand on the impact that Mercy Ships has in the African continent. Unlike the *Africa Mercy*, the *Global Mercy* is an original build, which presented new and unique challenges.

This article discusses the processes and challenges of designing and building the *Global Mercy*, key issues from a contracting and construction perspective, technical and operational challenges, and how Covid-19 has impacted the *Global Mercy*. In writing this article, we interviewed former chief information officer of Mercy Ships and now managing director of the *Global Mercy*, Chris Gregg, who was directly involved in bringing the ship into operation.

## Procurement and construction considerations

From a contracting perspective, it is interesting to consider how the procurement of a hospital ship compares to that of a land-built hospital. Ultimately, with the *Global Mercy* it came down to the need for specialised design and contracting skills which needed to be balanced against the control Mercy Ships required over the specifications, given the charity's extensive

experience in operating hospital ships.

For the *Global Mercy*, Mercy Ships completed the concept design and specifications for the ship in the first instance. These were strict and extensive to ensure the specialities of a hospital ship were met. The specifications focused on maximum space and size for training purposes, and capacity for serving and operating on patients.

The Mercy Ships concept was blended with a design for a ropax ferry – a roll on/roll off (ro-ro) vessel built for freight transport, but with passenger accommodation – which Stena had been developing. Deltamarin, a specialist marine design company, who had worked on the Stena concept, were also involved in the blended concept that became the *Global Mercy*. This was the concept package that was sent for tender to various shipyards.

A design and build contract was subsequently entered into with CSSC – the China State Shipbuilding Company – who subcontracted the design to Deltamarin. It was crucial to rely on the speciality of the contractor and subcontractor for this entirely purpose-built ship.

Throughout the process, Mercy Ships retained control of the information technology design aspects of the ship build. This was to ensure the implementation of the latest technology to ensure the most efficient operation of the ship as a hospital. For example, the *Global Mercy* has six operating theatres which require specialised technology. Further, medical staff onboard are able to run video training sessions from the operating room.

## Video links

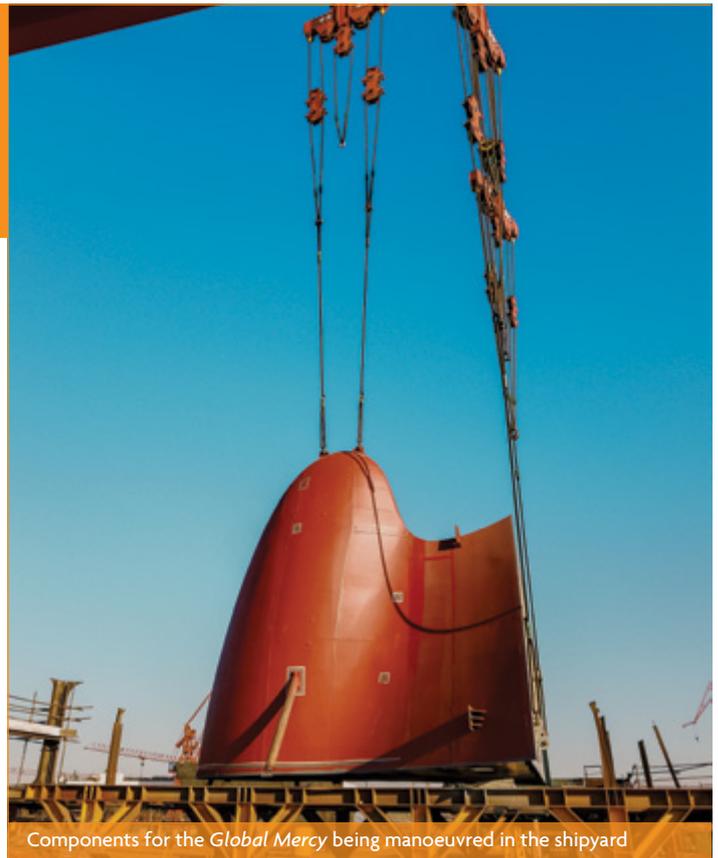
Watch a 30-second time-lapse of the *Global Mercy* shipyard build here – <https://bit.ly/3mR7Rik>

Watch a four-minute information video on the *Global Mercy* here – <https://bit.ly/2Gp0fUv>

The information technology for a hospital ultimately rests on efficiency as well as excellence. Most of the technology onboard, such as the training suite and simulation lounge, is focused on capturing what is happening, recording playback, and being able to ‘walk back’ for training purposes. All communications and most of the hospital functions are built on information technology. Compared to 800 network connections on the *Africa Mercy*, the *Global Mercy* has 4000 network connections and thus requires a significantly larger technical capability. Many features function on a separate system on the *Africa Mercy*, such as CCTVs and TV in cabins. However, these now operate on one system for the *Global Mercy*.

Other interesting features include LED lighting, variable frequency drives on electric motors, and reprocessing of water condensate for laundry. A big focus of the *Global Mercy* is on training, with two simulator rooms (approximately 90 sq m) with virtual and augmented reality, mannequins and other training tools, and a training debriefing room (approximately 30 sq m). The capital campaign in New Zealand also raised approximately \$1 million for the build of the intensive care unit (approximately 80 sq m). The ship will also feature a 682-seat auditorium, an accredited school for children, a gymnasium, pool, café and library.

The *Global Mercy* has taken approximately five years to build at the Tianjin Xingang Shipyard in China. The first steel cut was done in September 2015, and the keel was laid in December 2015. Compared to the usual land-based hospital construction, the building of the *Global Mercy* was especially unique with even



Components for the *Global Mercy* being manoeuvred in the shipyard

more significant health and safety considerations. For example, the *Global Mercy* has medical gas/oxygen that is piped throughout the hospital. This system required special attention and fire protection measures from a maritime perspective, balancing the fire risk of pumping oxygen around the ship with the gas supply needs of the hospital.

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The *Africa Mercy* was originally a passenger ferry and was acquired by Mercy Ships in 1999 and refurbished as a hospital ship



The design for the *Global Mercy* utilised modular construction technology

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The use of prefabrication also warrants discussion. This included assembling major components of the ship's structure at a manufacturing site and transporting the complete assemblies to the construction site. This practice was used extensively for the *Global Mercy*, including for the hull. The steel was cut into individual pieces and assembled into sections which were then put together in blocks. The blocks were landed into the dry dock and assembled into the ship. Prefabrication was also used for the ship's 'wet units' – the bathrooms, including toilet, sink and shower.

The *Global Mercy* was designed to align with the hospital ship charity's commitment to sustainability. It meets maritime requirements for low-sulphur emissions, and the systems provide reliable and efficient power. There is a system to filter and treat air-conditioning condensate water for technical use. This will reduce potable water use by 50%. There is also a high-efficiency air-conditioning system which will reduce total energy consumption by 15%.

### Challenges in bringing *Global Mercy* into operation

The process of bringing any project into operation has its challenges and this was particularly so in mobilising the *Global Mercy*. For example, ensuring the safe and staggered boarding of people on the ship requires a detailed plan with an incremental process. This involves ensuring there are sufficient hotel services such as a gallery and dining room to support the staged onboarding of crew and avoid overcrowding.

Current estimates are that the *Global Mercy* will have 40 containers of supplies loaded onto it after completion. Outfitting

of medical equipment will also be required. Completing these requirements in a safe and efficient manner will be a focus for Mercy Ships. Another potential challenge is noise which was an issue for the *Africa Mercy*.

The *Global Mercy* will operate in the Sub-Saharan region of Africa, complementing the work of the *Africa Mercy*. The ships will operate on a staggered cycle of six months, ensuring there is always one vessel in service. The ships are required to undergo annual maintenance, and the staggered approach allows an alternative ship to operate during that time. Helpfully, the maintenance periods of the *Global Mercy* will be shorter and less frequent.

Mercy Ships has a country engagement plan with a five-year cycle. This begins with developing a plan with the nation's Ministry of Health to strengthen their healthcare systems, includes a ten-month ship field service of surgical delivery and mentoring, and concludes with collaborative, in-depth assessment and evaluation. Mercy Ships will match up host country requirements to best fit each of the ships as the *Global Mercy* will have greater surgical and training capacity.

### Covid-19

The outbreak of Covid-19 has presented challenges to the launch of the *Global*

*Mercy*. The ship was built in China where a lockdown of three months was initiated on 23 January 2020. Works paused during this time, but resumed as soon as possible locally.

Transporting staff to China has also been difficult, but Scandinavian and Chinese staff on the site have continued with approval processes and construction. Mercy Ships will mobilise the *Global Mercy* into service as soon as possible, in a Covid-19 secure manner, while safely bringing in volunteers from across the world.

### Conclusion

The *Global Mercy* is scheduled to begin the journey to Africa in 2021, and will soon undergo sea trials. The first field service location will be in West Africa, providing desperately needed operations for people who have no other access to the help they need.

Despite the various challenges faced, the *Global Mercy* will soon be ready to provide life-changing services. Mercy Ships is still in search of medical, maritime and operational volunteers to help double the impact for those in need. For further information on this remarkable opportunity and inspiring organisation, visit their website.



Janine Stewart is the board chair of Mercy Ships New Zealand; she is a specialist construction and property lawyer, leading the MinterEllisonRuddWatts construction team, in which Irene Kim is a solicitor