



Estimating the benefits of Auror to New Zealand Police

August 2024

Key points: benefits at a glance

\$92m



WORKFORCE EFFICIENCY GAINS

Police can investigate crime and request evidence more efficiently with Auror

451



EQUIVALENT ADDITIONAL OFFICERS

Use of Auror by Police and retailers was potentially the equivalent to adding 451 officers to the force

170,000



HOURS OF CAPABILITY UPLIFT

Auror allows Police to free up resources for core policing

6.8m



SAVINGS IN KILOMETRES DRIVEN

Auror's digital delivery of crime reports and evidence collection means fewer trips on those tasks

1,234



TONNES OF CO2 EMISSIONS SAVED OR REDIRECTED

Fewer trips means Police carbon footprint either shrinks or is put to better use

Summary

Global trends show a surge in retail theft. This crime type costs over \$150 billion annually, much of which is linked to more serious organised crime and at times is accompanied by violent behaviour. Retailers the world over have renewed emphasis on addressing retail crime, not simply for the commercial rationale of loss prevention, but primarily for the safety and security of their teams and property.

Other global trends point to the challenge of recruitment into law enforcement, with police forces competing for a diminishing talent pool with limited resources. More needing to be done with less is a feature of law enforcement systems internationally.

Alongside these challenges, positive innovation is also occurring in policing. More police agencies are digitally transforming their practices to increase productivity and create capability, at times partnering with third parties to deliver that uplift through innovative technology. These providers build solutions that deliver the information required to ensure the 'boots on the ground' continue to provide effective core policing.

New Zealand Police (NZP) has been a leader in this space given its adoption of technology, including that of New Zealand-founded global software provider, Auror. By quantifying the benefit of that adoption for NZP this report reveals significant positive impacts over the 12-month period assessed. The impacts are impressive, even as we have been

deliberately conservative in our assessment. These include potentially: **\$92 million** in workforce efficiency gains (660,000 hours) and **\$23 million** (170,000 hours) in capability uplift for the year ending in June 2023. Ultimately, we estimate the combined impact from using the Auror retail crime reporting and evidence request software, is potentially the fully-funded equivalent of an additional **451 constables** for that same period. We further estimate that NZP had the opportunity to redirect or save **1,234 tonnes of CO2** that would have been emitted from its vehicle fleet by manually gathering evidence and taking reports associated with crime.

As NZP noted to us, through its ongoing 10+ year, software as a service engagement with Auror, it has effectively accessed the speed of private sector innovation that delivers a secure, cloud-based, continually improving IT platform, with the upside of Auror's ability to innovate across its various global markets, and few of the downside risks of being tied to a bespoke system that atrophies over time.

This independent report has been contributed to with insights from NZP and Auror to illustrate the benefits of harnessing technology in public safety and a perhaps renewed sense of *shared* responsibility for community welfare, fit for the digital age.

*“Auror plays an integral role in ensuring as many resources as possible are devoted to **the things the public care about.**”*

New Zealand Police

*“We are always looking for ways to prevent crime and keep our site teams as safe as possible. We believe that working alongside the Police and with the use of technology like the Auror platform can both **prevent crime and solve cases faster.**”*

Tim Bailey, Head of Retail – Z Energy

*“In New Zealand, we now know that over **60% of retail theft is caused by 10% offenders.** We are proud that our team can not only reveal this fact, but also help in that next step of enabling Police, businesses and communities to collaborate to effectively address it. When security guards and checkout operators tell us that they feel safer coming to work every day because of Auror; that's special to be a part of.”*

Phil Thomson, Auror Co-Founder & CEO

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1. Purpose of report

Retail crime is a global problem that is on the rise. Worldwide it costs businesses over \$150 billion in loss annually¹ and is a social and economic scourge on communities, as stretched law enforcement resources contend with this high-volume crime that is often accompanied by violence and aggression. Endemic retail crime in some cities is leading to a sharp depreciation in property values, the closure of retail outlets and a lack of services, like pharmacies, being available to the community.² In New Zealand alone, retail crime costs the economy \$2.5 billion every year.³

Although retail crime is sometimes labelled as low value in monetary terms, it does not occur in a vacuum. The global trend, also consistent in New Zealand, shows the majority of retail crime is organised by criminal enterprises with links to more serious offending. What appears to be ‘small crime’ is actually ‘big crime’.

Policing continues to evolve in the use of technology and the role it plays in creating efficiencies and capabilities in maintaining public trust and confidence. NZP is emerging as a leading technology-enabled police force, due to its early adoption of mobile devices, its digital evidence strategy, its own internal technology advisory groups *and* its deliberate use of Auror software, which for the first time digitally connects law enforcement and retailers. Our multiple interviews with NZP recognised

the vital aspect of Auror in how NZP investigates crime across New Zealand.

This report identifies and analyses the benefits that Auror has created for NZP in its digital transformation of labour-intensive processes to increase productivity and create capability, by focusing on two key services made available through the software: Retail Crime Reporting and Evidence Requests.

2. Limitations and caveats

We focus solely on the benefits of the Auror platform to NZP. The benefits to retailers of lower cost reporting of retail crime and potential decreases in incidents would be additional to those presented here. There may also be uncaptured benefits to society in terms of crime prevention, resolution of more crime, or the freeing up of police resources to focus on core policing.

We have taken a snapshot, single-year (fiscal year 2023) approach to estimating the benefits of Auror to NZP. This year was the first in which both Retail Crime Reporting and Evidence Requests were available nationwide. We have not captured the benefits to NZP of these services in previous years when usage was less available.

We have sought to use conservative assumptions from external sources wherever possible (see Appendix A). We note that with respect to reports to NZP of retail crime, the reality is that not all reports could have been acted on. However, our estimates reflect key assumptions including that all reports would have to be handled by NZP in some way and that while some

¹ <https://apprissretail.com/resource/2023-national-retail-security-survey-report/>

² <https://www.forbes.com/sites/pamdanziger/2023/06/14/westfield-mall-joins-the-mass-retail-exodus-out-of-san-francisco/?sh=506eb0a95995>

³ <https://www.stuff.co.nz/national/crime/133055708/retail-crime-costing-more-than-25-billion-a-year-retail-nz-survey>

reports would have been addressed after a short period, others would have taken much longer (we have used an average figure).

It is also important to note that police work is complex and dynamic. Efficiency gains in one area does not mean a new source of funds is created for redistribution. Benefits are often qualitative. Nonetheless, inputs such as time spent, distance travelled, and labour costs can still be estimated and considered to provide an assessment of the impacts of new technologies.

Finally, we note that the total number of retail crime incidents recorded into the Auror system during the time period assessed is well over double the number of reports made directly to NZP via the system's Direct to Police reporting functionality.

3. Auror

Auror is a New Zealand-founded and headquartered global software as a service company providing crime reporting services between retailers and law enforcement. It is a market leader in the field of *technology-enabled policing* (TEP), with NZP being its first law enforcement partner and most developed. The company operates in New Zealand, Australia, Canada, the US and UK and engages with a significant number of police agencies in those jurisdictions. Its retail customers include some of the largest and well known retail and fuel organisations both globally and in New Zealand.

Retailers record instances of harm and loss in their stores into Auror as well as using the functionality to report directly to NZP. This includes instances of theft, but also violence, aggression, abuse and vandalism. Through automated number plate recognition (ANPR) technology, retailers also keep their sites and people safe by identifying vehicles

known to be associated with previous offending in their stores. Retailers can fulfil lawful requests for information (such as CCTV information) made by NZP through the Auror platform as well. Requests for information concerning serious crime previously would often occur by NZP appealing via television or even social media for sightings of vehicles. NZP would also manually collect evidence from known sources such as service stations or car park CCTV operators.

That physical and at times challenging process still occurs when further information is needed. However, the modernisation and digitisation of that lawful and manual NZP activity in the requesting and receiving of information and logging of crime reports has had dramatic, positive impacts. NZP generally no longer need to physically visit a store, take statements or receive video evidence on a USB stick by hand; all can be digitally created and conveyed.

In addition to providing retailers with business insights to inform their own loss prevention and safety practices, NZP gains visibility of total offending across retailers and a mechanism to request specific information efficiently. This significantly reduces time spent on labour-intensive tasks, freeing up limited resources to focus on core policing.

Useful, historic retail crime patterns emerge from the reported data. For example, the software reveals significant organised crime in retail theft in New Zealand, with 10 percent of offenders causing over 60 percent of loss, and nearly 20 percent of shoplifting involves violent or threatening behaviour. ⁴

With retailers on one side, and law enforcement on the other, Auror's software connecting them creates a positive two-way network effect where more customers recording more crime strengthens a given community's

⁴ January - August 2023

ability to prevent crime together, in collaboration with more targeted policing.

4. Background to study

4.1 Brief history of the Auror-NZP relationship

Auror and NZP have had a relationship since 2014 following Auror's software being trialled in four Woolworths (then Countdown) stores in West Auckland.

Over time, new system and information security features, and oversight measures have been introduced and strengthened including Single Sign On and Auditing functionality, which are now replicated in other markets.

Auror's software allowed NZP to better target their resources on prolific offenders; those responsible for a disproportionate amount of retail theft. In 2021, in response to that uplift and to combat a concerning trend in retail crime, NZP established the National Retail Investigation Support Unit (NRISU) to more formally operationalise and increase its impact on retail crime. As NZP's NRISU notes, "today, **nearly 100% of the NRISU work is completed using the [Auror] platform.**"

In 2021, in response to retailers concerns about the time they spent on responding to requests for information from law enforcement as part of more serious criminal investigations, Auror developed technology which enabled law enforcement to make lawful evidence requests of retailers (and for retailers to fulfil those requests) for non-retail crime investigations, in a secure, digital format (see below in Evidence Requests).

4.2 Overview of key Auror products

4.2.1 Retail Crime Reporting (RCR)

Auror's crime reporting software is used by retailers to record and report instances of violence and loss in their stores.

This is generally instances of retail theft, but can include threatening or violent behaviour, including assault, harassment, and destruction of property.

Auror's software is based on a convenient and simple user experience. It enables retailers to record crimes and incidents in their stores quickly and efficiently, and voluntarily share this information with NZP, providing valuable insights NZP may otherwise not receive in a full or timely manner.

Building on this in 2015, Auror added a 'Direct to Police' functionality, enabling retailers to officially report retail crime directly to NZP, thus removing the double handling of reporting via the emergency contact centre (111 calls) or NZP's non-urgent crime reporting (now referred to as 105 reports).

The incident recording and Direct to Police functionalities save retailers on average between one to two hours per incident, as well as saving NZP between one to seven hours per incident. Aside from those direct savings, the side benefit of this functionality to NZP is to gain a more comprehensive picture of total offending across a region in a timely manner, revealing patterns of behaviour that allows more targeted deployment of precious resources.

4.2.2 Evidence Requests (ER)

A significant portion of NZP time is spent on lengthy evidence gathering processes (such as requesting, collecting, and reviewing CCTV footage). Prior to the introduction of Auror's ER, a video evidence request lawfully made by NZP to retailers across New Zealand for the investigation of crime could be time-consuming and resource intensive for both parties.

NZP would typically physically approach an organisation known to be operating Automatic Number Plate Recognition (ANPR) systems, such as a fuel station, and request vehicle information. Police would need to physically visit a store, take statements, receive video evidence on a USB stick or CD by hand, and then search through (sometimes hours) of footage. This added significant time, potentially prolonging an investigation process, creating frustrations, risking the loss of evidence, potentially compromising operational integrity, and compromising individual or community safety.

According to one fuel retailer, before ER was introduced "**it was taking more than 50,000 hours a year across our sites**" to respond to NZP requests.

In response, in 2021, Auror added evidence request functionality, called Video Retrieval (VR), to its platform. VR is enabled by ANPR technology and simply digitised the existing manual, lawful NZP process of requesting evidence from organisations. Aside from the efficiency gained through digitisation, it had other significant privacy and security benefits as well:

- It ensured officers only gained access to the **specific footage** needed for specific policing matters - evidence requests and responses between Police and retailers is at level of specificity that limits the sharing of excessive and unnecessary

information (for example, the relevant five-minute clip is shared, rather than the whole two hour video).

- It strengthened the chain of custody for evidence by removing the risks of lost USB sticks or CDs used to store evidence.
- It conveys information within a closed, private system.
- It lessens the risk to investigations by containing the request for evidence within a restricted private system (i.e. the risk of a person revealing an investigation is reduced).

One NZP participant in Auror's initial VR trial said "**sometimes it used to take days to get footage to a point I could watch... Now it's a matter of minutes**".

5. Our approach

5.1 Scope of analysis

We quantitatively estimate the efficiency gains and capability uplift for NZP from their use of Auror's platform – namely RCR and ER – in the fiscal year to June 2023.

We chose this year because the ER functionality was available nationwide in July 2022, giving us a full 12 months of data.

We restrict our empirical analysis to the benefits for NZP. We do not measure indirect benefits for other parts of the justice system (e.g. better-quality evidence leading to a reduction in court case length or to more resolutions). Similarly, we do not measure the effect on, for example, incarceration rates. We do not measure any benefits to retailers. We also present interview-based reflections from the main users of Auror in New Zealand – NZP and retailers.

5.2 Key benefits of Auror

5.1.1 Workforce efficiency benefits

Auror's platform makes NZP more efficient by reducing the time spent on each case.

For both RCR and ER, we multiply the status quo⁵ cases by the average time saving per case to estimate the total time savings. We multiply total

time savings by the average NZP hourly cost of labour to estimate labour cost savings.

In addition to labour cost savings, we estimate the number of constables that could be hired at the implied annual cost of a police officer. We note that while all reports need to be handled by NZP in some way, in reality, not all reports to NZP would have received a similar level of attention. Our estimate should be read in the context of NZP having to handle each crime reported to them via Auror in some way. While we only base our estimates on the official 83,842 reports made to NZP by retailers via the platform, we note that the recorded events in Auror over the assessed period were well over double that.

5.2.2 Capability uplift

In addition to reducing the NZP time required for *existing* volumes of crime (i.e. the status quo number of cases), using Auror products frees up NZP time to investigate *additional* cases. We refer to this as the 'capability uplift' associated with Auror.

We estimate capability uplift for ER only. This is because we have a clearer 'before ER' period to help us determine the status quo number of cases, given ER was only available nationwide in July 2022. While we suspect there are capability uplifts within RCR, to quantify this benefit falls outside the current scope of work. In contrast, RCR was initially introduced in 2014 and gradually rolled out nationwide. We do not have case numbers prior to 2014 to use as a RCR status quo estimate.

⁵ See Appendix A for our assumptions on status quo cases.

We multiply the additional capability by the average time savings. This estimates the number of hours that would be saved by investigating the additional capability with ER compared to without it.

We multiply by the average hourly cost of labour to estimate labour cost savings of investigating the additional capability with ER. We show how many additional constables could be hired using the labour cost savings.

5.2.3 Travel savings

The Auror products provide NZP with evidence and police statements digitally through the platform. NZP staff no longer need to drive to crime sites to interview retailers and collect evidence, redirecting or conserving fuel use and CO₂ emissions generated. We say 'redirecting' rather than 'direct savings' because NZP will undertake multiple tasks in one trip, rather than simply retail crime.

We estimate distance savings by multiplying the number of status quo cases by the average distance travelled to retail crime scenes. We estimate fuel cost and emissions savings by multiplying the distance saved by the average cost of fuel per kilometre and an emissions factor respectively.

Our key assumptions and sources are shown in Appendix A. We have sought to use publicly available sources wherever possible.

6. Estimates of benefits

6.1 Workforce efficiency gains

We estimate that the combined labour efficiency gain for NZP from using the Auror platform is around \$92 million, or the fully-funded equivalent of 359 Constables.

Table 1 presents the estimated efficiency gains from labour cost savings for RCR and ER respectively, for the year ended June 2023.

They can be interpreted as the labour cost savings to NZP for dealing with the amount of cases that would have happened if Auror was not in place.

TABLE 1 LABOUR EFFICIENCY GAINS

	Cases	Time savings (hours)	Labour cost saving	Equivalent Constables
RCR	83,842	293,400	\$40.8m	159
ER	160,166	368,300	\$51.2m	200
Total		661,700	\$92.0m	359

SOURCE: SENSE PARTNERS ESTIMATES

6.2 Capability uplift benefits

TABLE 2 CAPABILITY UPLIFT FROM ER

	Additional requests / responses	Uplift created (hours)	Value of uplift (\$)	Equivalent Constables
ER	73,867	169,900	\$23.6m	92

SOURCE: SENSE PARTNERS ESTIMATES

In addition to the labour efficiency gains for the ER software, NZP also benefits from a capability uplift. That is, ER activity is above what would otherwise have been possible due to efficiency gains.

We estimate, using Auror data, an additional 73,867 requests and responses were possible in the year to June 2023 from increased use of ER.

This capability uplift has an implied value of around \$23.6 million, or the equivalent of an additional 92 Constables.

6.3 Travel savings

By using digital technology via Auror's platform, we estimate NZP no longer needs to travel to around 244,000 destinations to gather retail crime reports or retrieve evidence.

At an average of 28 km per trip, this equates potential redistribution of over 6.8 million kilometres.

In turn NZP becomes more fuel efficient – potentially around \$1.55 million for the year ended June 2023. The NZP fleet also can be more efficient with respect to 1,234 tonnes of emissions.⁶

TABLE 3 TRAVEL SAVINGS

	Trips efficiency	Travel efficiency (kms)	Fuel cost efficiency (\$)	Emissions efficiency (t/CO ₂)	Emissions efficiency (\$)
RCR	83,842	2.35m	\$0.53m	424	\$22,000
ER	160,166	4.48m	\$1.02m	810	\$42,000
Total	244,000	6.83m	\$1.55m	1,234	\$64,000

SOURCE: SENSE PARTNERS ESTIMATES

⁶Note these emissions cost savings are not additional to the fuel savings because the New Zealand ETS price is already built into fuel retailers' prices.

7. Qualitative insights

We highlight below some key themes from interviews with NZP and a retailer about their experiences using Auror.

7.1 A retailer's perspective ⁷

Key takeaways

- Retailers are acutely aware of the role they can play in helping to solve serious crime in their communities.
- Doing so, historically, came at considerable cost to businesses.
- Innovating alongside Auror and NZP allows for collective responsibility without associated crippling costs.

In their own words

"Our...team is committed to our communities, and that also means helping to stop crime in our communities. We want to continue to help New Zealand Police to solve serious crime - faster.

For our business, this did come with a cost. Every time a police officer would visit one of our retail sites to collect footage that may be required for an investigation into serious crime, this would mean a staff member would be

⁷Excerpts from interview with a leading NZ retailer.

required to assist them. This would take time away from serving customers; painstakingly searching and pulling CCTV footage. On average, for every request a team member would spend at least 60 minutes to help locate what was needed - often more. We calculated that it was taking more than 50,000 hours a year across our sites.

This changed as a result of Auror's Evidence Requests and Video Retrieval. This process has moved from being a pain point to being a seamless process.

From a retailer point of view, this functionality saved us a significant amount annually in productivity savings at least, and has further enabled us to help New Zealand even more - effectively adding the equivalent of more valuable Police officers who are likely to assist us with solving serious the crimes. For us, this means we get to contribute to our communities by helping Police stop crime, but it doesn't grind our business to a halt either.

We value what this new technology and relationship it brings - it means we can feel good about how we're helping to create better and faster outcomes for our communities, and we get to be part of the solution. It allows both [us and] Police...to concentrate on the work we do best, and to be more efficient."

7.2 Police HQ's perspectives⁸

Key takeaways

- Auror is a trusted software as a service provider to NZP, at the leading edge of innovation in the future of effective policing and NZP is an advanced force globally in its use of technology.
- NZP saves time and money through its relationship with Auror, and further facilitates more resources to be directed to the front line for core policing.
- Auror delivers technological advances, innovation and cost efficiencies back to NZP through its ability to scale across multiple jurisdictions and law enforcement agencies globally.
- While Auror has simply digitised the existing lawful (yet manual) practices of NZP engagement with retailers, and these effects have been profound, it also has strong commercial incentives to get the balance right between protecting privacy and appropriate information sharing in the pursuit of holding offenders to account.
- Continuing to invest in all types of technology will enable more and better core policing - thus creating more visible 'blue shirts' in our communities, better and faster resolutions, and increasing community trust and confidence.

⁸These reflections are based on interviews with NZP staff.

The demand for NZP resources is significant

It is generally true in most societies that demand for policing far outstrips capacity. In this context NZP has to make decisions every day about where best to deploy its resources. There are only so many 'blue shirts' available and there is a tension between the desire for NZP staff to be more visible in the community and their ability to process complex information at their desks to solve crimes.

In the modern policing environment, NZP's relationships with third party providers such as Auror play an integral role in ensuring as many resources as possible are devoted to the things the public care about (such as core policing, serious crime and public safety) while reducing the back office administrative burden on staff.

Auror delivers a clear picture of total offending, not simply information

NZP is better placed to address crime efficiently when it understands the crime environment better. Auror plays a positive role here. It relieves the pressure on resources by generating a coherent picture of the criminal landscape for retail crime, identifying patterns of criminal behaviour and allowing NZP to access it in a secure, accessible and convenient format.

One NZP participant in Auror's initial ER/VR trial said **"sometimes it used to take days to get footage to a point I could watch... Now it's a matter of minutes"**.

Auror avoids creating a situation of 'information overload' that soaks up scarce NZP time by connecting the dots between incidents into actionable information.

This in turn helps NZP focus its attention on the most prolific offenders, where it is most likely to secure a positive outcome for society.

NZP benefits from private sector innovation and scale

Many large organisations have experiences of investing in bespoke IT systems that start off as functional and meeting staff needs, but which become outdated and clunky over time. IT resources are devoted to maintenance and patching over problems, rather than on investing in innovation.

By having a relationship with Auror, NZP has effectively accessed the speed of private sector innovation that delivers a cloud-based, continually improving IT platform. NZP gets all the upside of Auror's ability to innovate across its various global markets and few of the downside risks of buying a point-in-time system that atrophies over time.

Auror has strong incentives to ensure privacy is safeguarded

There is a delicate balance between safeguarding privacy and enabling NZP to access evidence to solve crimes efficiently and effectively. But Auror has very strong commercial imperatives to get this balance right. It has shown this need not be a binary choice. It obviously has to comply with laws, but also maintain its social license to operate by ensuring fit for purpose privacy and information security safeguards, while also achieving its core purpose for its customers and law enforcement.

Appendix A Assumptions

TABLE 4 ASSUMPTIONS FOR BENEFIT CALCULATIONS

Assumption	Estimate	Source/reasoning
Counts of RCR and ER cases.		Auror
Average time saving per retail crime report.	3.5 hours	NRISU [June 2023]
Average time saving per evidence retrieval.	2.3 hours	NZP study of the ER pilot. Phipps C, released by NZP Evidence Based Policing [September 2021]
Hourly cost of a police officer's time.	\$139	New Zealand Treasury CBAX tool. Includes overhead costs as well as salary costs.
Implied annual cost of a police officer.	\$255,951	The hourly cost of a police officer's time multiplied by the hours per year worked.
Average distance travelled to collect information for a retail crime report or to retrieve evidence.	28 km	NZP study of the ER pilot. Phipps C, released by NZP Evidence Based Policing. It seems reasonable to think this distance is similar when officers collect information for a retail crime report.
Average fuel use of NZP vehicle fleet.	0.09 litres per km	Australian Government Green Vehicle Guide estimate for Holden SV6 Commodores. ⁹
Emissions generated per kilometre travelled.	0.00018 tonnes of CO ₂ p/km	NZP website, average emissions of its fleet.
Average cost of petrol.	\$2.53 p/l	MBIE data files on Quarterly Nominal Average Fuel prices.
Average price of NZ ETS units.	\$51.79	For June 2023, sourced from theecanmole website.
Hours per year worked by NZP officers.	1,840	46 weeks per year, 40 hours per week.

⁹ NZP are transitioning to a more energy efficient fleet by procuring Škoda Superb vehicles. However, it is unclear how many Škoda vehicles were in use during the study period compared to Holden vehicles, so we have used the fuel use estimate for

Holdens in our estimates. To the extent Škodas are more fuel efficient than Holdens, this would lead to a slight overstatement of fuel and emissions savings.

Assumption	Estimate	Source/reasoning
RCR has not increased NZP capability	N/A	Auror does not have retail crime report counts at the introduction of RCR (approximately 2015) so we cannot estimate the capability uplift.
Status quo cases for RCR	83,842	Auror, based on assumption that all crime reports in year to June 2023 would have needed to be filed without Auror.
Status quo cases for ER	160,116	Auror, based on 12 times monthly volumes over July-Sept 2023, which reflect NZP capacity pre-ER.

Disclosure:

Auror commissioned Sense Partners to provide this independent economic analysis of its software's impact on New Zealand Police (NZP). NZP, Auror and retailers have provided information for this analysis.



SENSE PARTNERS

DATA LOGIC ACTION