



Using Data and Technology Innovation to Benefit Society

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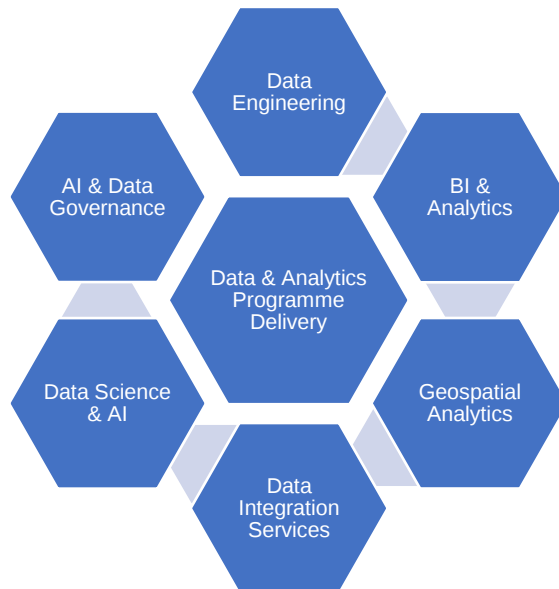


A bit about Auckland Transport

Auckland Transport are a council-controlled organisation that manages \$27 billion worth of transport-related assets in Auckland. This includes roads, footpaths, cycleways, parking and public transport assets.

Our mission is to care for, enable and deliver an effective, efficient and safe transport system that contributes to a more thriving and sustainable Tāmaki Makaurau Auckland.

We work to the direction of Auckland Council and central government through several policies and long-term plans that guide the way the transport system is developed.



My group in Auckland Transport is responsible for:

- Data & AI governance
- Data science & AI
- Data engineering
- Business intelligence & advanced analytics
- Geospatial analytics and location intelligence
- Data integration services
- Programme delivery for the above



How we got here....

Auckland Transport's data strategy has played a crucial role in transforming the organisation into an insight-driven organisation (IDO). Here are some keyways in which the strategy has contributed to this transformation:

1. **Clear vision and roadmap** to guide a set of actions that support Auckland Transport in becoming an insight-driven organisation.
2. **Stakeholder engagement** to understand the current state of Auckland Transport's analytics capability and identifying high-value strategic use cases to unlock value.
3. **Strategic alignment** to ensure that future investments in supporting data and technology capabilities are business-driven and aligned with strategic objectives.
4. **Building awareness** of the value and possibilities of data and advanced analytics. It helps in telling the story of value to create buy-in and support change and communication.
5. **Foundational initiatives** such as talent considerations, architecture considerations and use case development.

Having this strategy in place provided the **foundation and framework to engage with the key parts of the organisation** around using data to develop innovative solutions that would make a difference and drive positive outcomes for the organisation and Aucklanders using our services.

Which has enabled us to get to this position and for me to be able to show you these examples.....

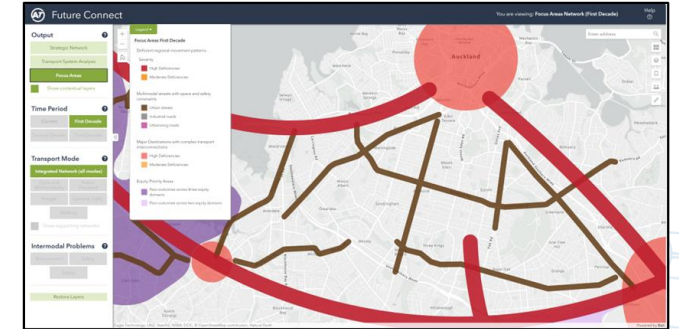


Some of what we have done so far....

Geospatial and Analytics Innovation

Future Connect

- Long-term network plan for Auckland's transport system widely accessed by the public
- Identifies the most important parts of the transport network and the most critical issues and opportunities



Geospatial Open Data Portal

- Providing maps of services as diverse as boat mooring locations, the cycle facility network, roading services and more

Geospatial mapping of network safety

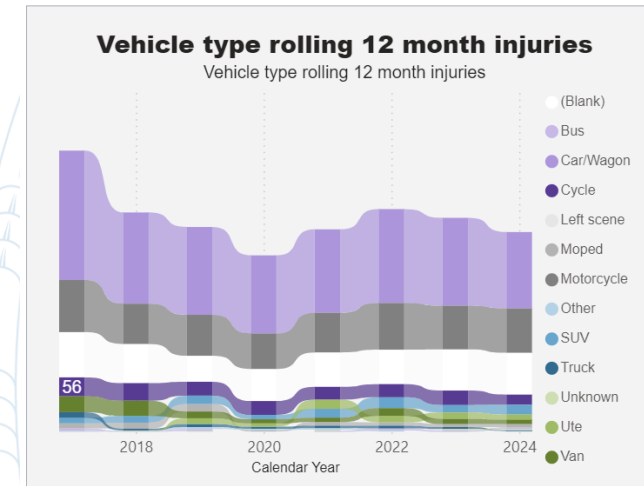
- Data based on Crash Analysis System (CAS) and showing deaths and serious Injuries (DSI)

Analytics Safety Intelligence Tool

- Made available to local board members to provide information on road incidents

Crowd management analytics

- For the 2021 America's Cup in Auckland, we developed a crowd safety intelligence solution using computer vision to count spectator numbers in the fan zone in realtime and avoid overcrowding by controlling flows.



Some of what we have done so far....

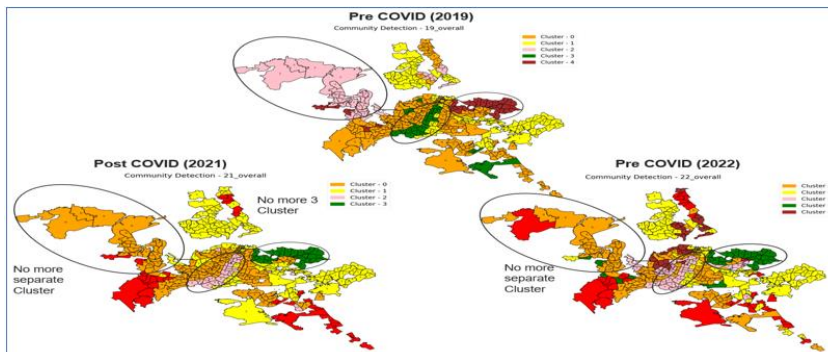
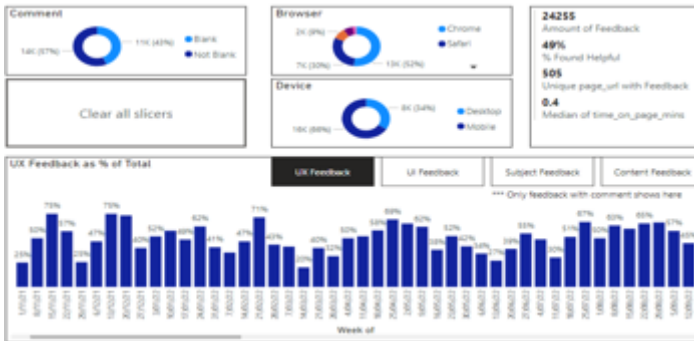
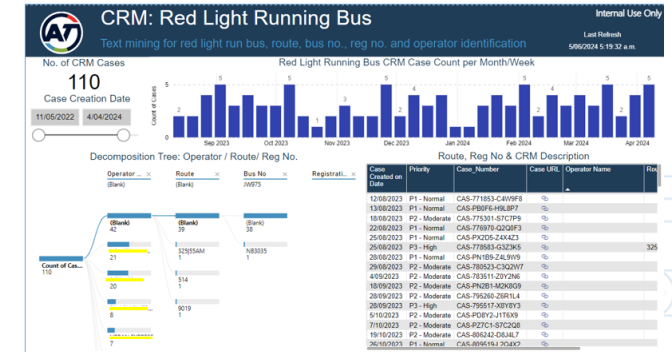
Data science, machine learning & Generative AI

Official Information Act (OIA) response generator

- Use of Generative AI on five years historic OIA requests and responses for CCTV information to improve response times and consistency for the public.

Red light bus running

- Text analytics of CRM cases to better identify numbers and bus trips to manage driver behaviour.



Digital experience

- Using Natural Language Processing (NLP) to classify and cluster public feedback about our website into common topics and areas to support improvement and customer experience.

Insights for schools

- Using text mining of AT CRM data and spatial analytics to associate cases with specific schools, identify key themes, and quantify the information to better understand the specific issues faced by schools to improve our services to them.

Covid impact analysis

- Understanding the impacts of Covid-19 by detecting changes in travel patterns for key transport hubs and routes, to support decision making on expected patronage recovery and capacity optimisation.

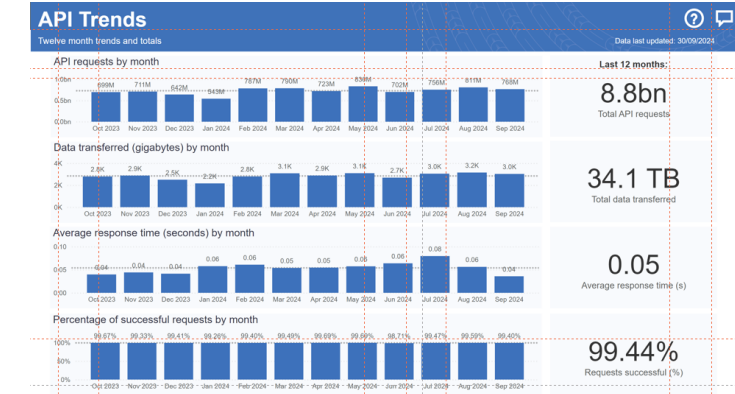


How has this work benefited society?

Real Time Data Portal

- Provides data on public transport planned / scheduled services, planned transport network disruptions and near real-time bus location data
- Serving approx. 80k data requests per month, 1.2 TB of data with an avg. response time of 0.04 seconds
- We collaborate with the major tech companies – Google, Apple & HERE to incorporate this data into their applications to support Aucklanders' journeys
- This helps people access our services, through whatever channel they choose

Annual Data Consumption trends



How has this made a difference for our communities?

- We are focused on **improving customer experience** for Aucklanders, listening and responding to what they are saying
- By sharing our data, we make it **easier for customers to access our services**, even via third party applications
- By making data and insights available to elected representatives they can better **represent the needs of their communities** in relation to road safety initiatives
- By using Generative AI, we have been able to significantly **reduce the time to respond to OIA requests** on CCTV data
- The use of **NLP** has allowed us to **rapidly process customer feedback** and respond with improvements to our website
- Using patronage travel and mobile location data we were better able to **optimise our return of public transport services** following Covid-19
- And we are constantly **monitoring and managing our service partners** to ensure customer safety



Some of what we are currently working on....

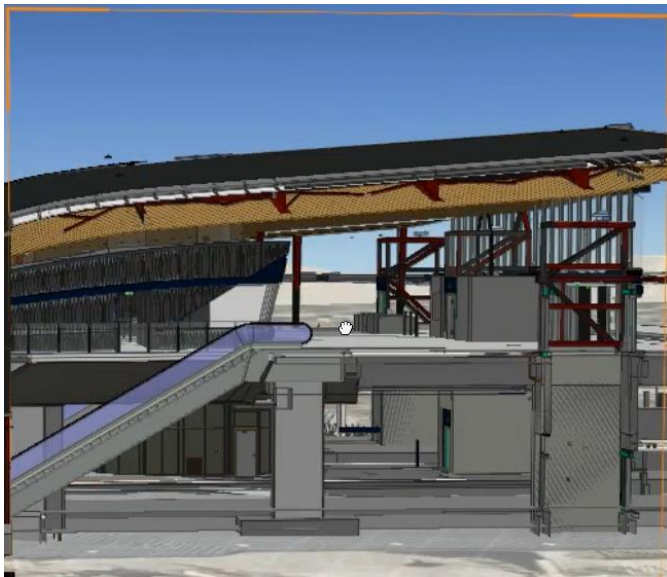
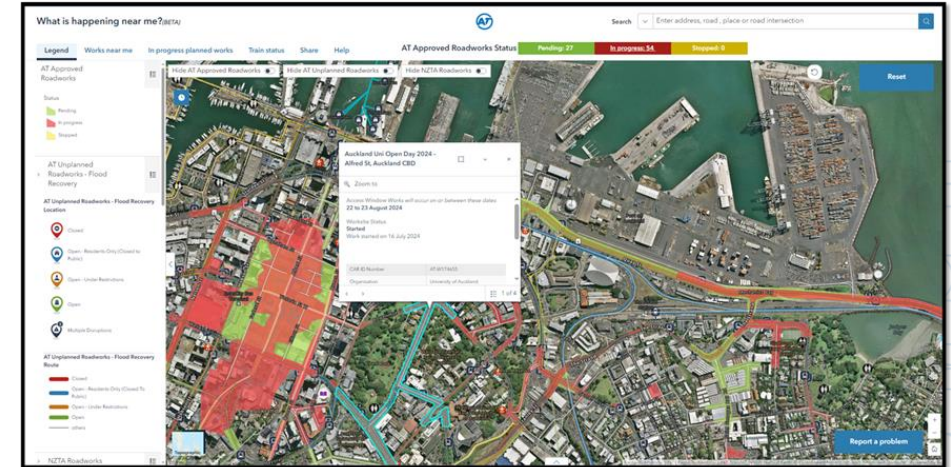
Geospatial Innovation

“NearMe”

- Spatial application to be made publicly available to show Aucklanders what is happening and planned on the roading network “**near them**” and feedback received from our communities

Activity coordination

- Investment in a **collaborative platform** for multiple agencies wishing to undertake roadworks to coordinate their activities to **minimise disruption (and cones!)** on our roads



Puhinui Station

Digital twins for public transport hubs

- Initial focus is on new rail and City Rail Link (CRL) stations
- Will support station management and **asset maintenance** with real-time IOT data to improve operations
- Incorporates safety measures using computer vision to capture **customer location on platforms** and **alerts drivers** if anyone is in danger
- Version will be made public to support **familiarity with station layouts** and internal wayfinding across the CRL network
- Make these Digital Twins available to **first responders** for navigating these stations in an emergency



Some of what we are currently working on cont'd...

Data Science and AI innovation

On-street parking predictor

- Creating a parking occupancy forecast model to help our customers plan their parking and journeys in advance. It will also support parking plans for special event days.

Official Information Act requests

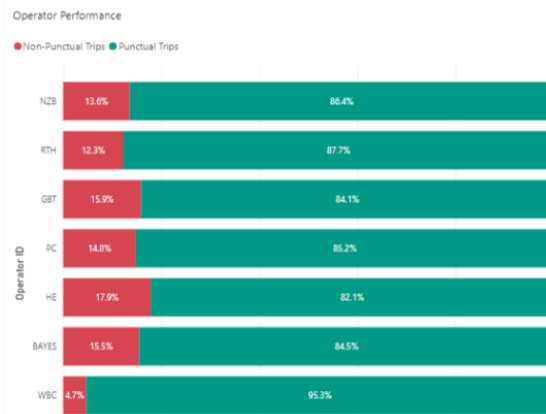
- Extending the CCTV Gen AI solution to all types of OIA requests!

Frequently Asked Questions

- Using Gen AI and AT's CRM Q&A knowledge base to improve the consistency and response times to the approx. 1.4M customer queries received each year

AT website chatbot

- Using Gen AI for personalised customer interactions on the AT website to help Aucklanders find information easier



Real-time Data Innovation

- Real-time data coming off the bus, train and ferry network is processed using stream processing through Kafka in real-time, to give us a view on operational status and schedule adherence of the fleet.
- Enables AT to better manage public transport reliability for Aucklanders



How will the current innovation benefit society?

Expected benefits we'll be able to deliver for people across Auckland

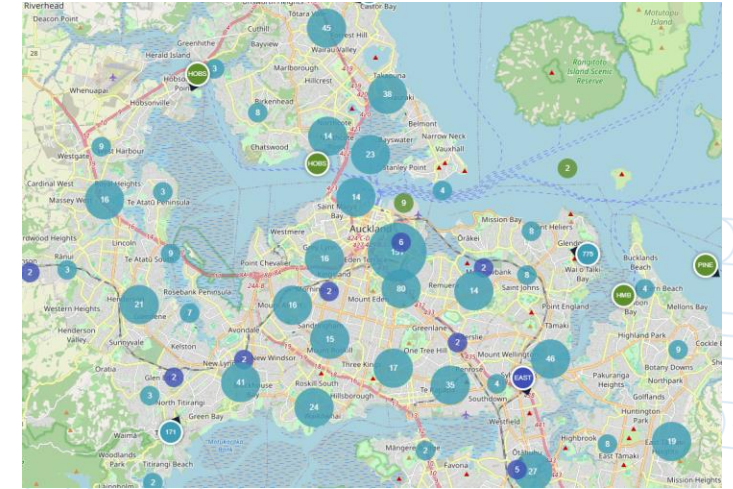
- Improved disaster recovery readiness
 - Enhanced response capabilities and provide more accurate information on the state of Auckland's network
- Better information for Aucklanders to help with their travel choices
 - Increased accessibility to information and enhanced public awareness
- Less disruptions, which helps support increased public transport patronage and traffic flow on our streets
 - Smoother operations & reduced downtime
- Easier, more safe and seamless journeys
- Visibility of CRL stations to help realise the benefits of this transformational change in our passenger train network
- Improved parking management to free up space on the road for more stress-free journeys
- Enhanced customer service through chatbots
- Increased efficiency in case management through use of AI



Where to next with innovation initiatives....

Data science, AI and Geospatial innovation

- Continue with **Generative AI solutions** and start to move to **external public facing solutions** that help Aucklanders
- Transport **network optimization using ML algorithms** trained on historical network performance using our own traffic count data, public transport schedule adherence data, plus mobile location data **so we can cover all transport modes**



Open data initiatives

- Making more of the data collected by Auckland Transport **available to the public**
- Using text analytics on our CRM data we have identified the **top ten most requested types of data** – a good starting point!
- Focusing on more data sharing across not only the Auckland Council group CCOs, but also **collaborating with other aligned government agencies like NZTA and Kāinga Ora**

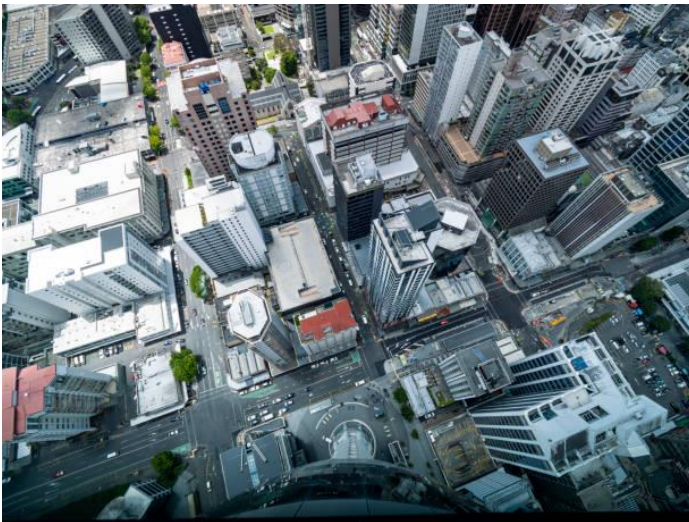


Where to next with innovation initiatives....

Combining Geospatial and AI/ML for Innovation

Working with a **global partner to pilot a digital twin** of a section of the Auckland road network to enhance and optimise traffic light phasing. This involves:

- Combination of **Geospatial and Machine Learning**
- Utilizing vast amounts of **historical IoT data** for model training
- Then in when place will consume **real-time data for constant adaptation**
- Resulting in **optimised traffic light sequencing** to handles daily traffic “tidal flows”



Benefits for our communities:

- Increased people movement
- Better **management of planned disruptions** like events and construction sites; and **unplanned disruptions**, for example the International Convention Centre fire, bridge closures, etc.
- Leading to *“Easier Journeys for Aucklanders”*



How will the future innovation benefit society?

Expected benefits from future data and analytics innovation

- Optimising traffic flows promotes **journey's that are quicker, easier and safer** to get our city moving
- Enhancing the efficiency of the Auckland road network is good for **improving our sustainability for healthier, thriving communities**
- Utilising AI for improved network planning allows us to **adapt more quickly to the changes in travel patterns and growth in the city** – so we're able to provide a convenient, well-connected, accessible transport system
- Providing transparency through accessible data and information **enhances citizen participation and innovation**
- It **enhances our communication** and engagement efforts with Aucklanders around how our services are performing, so we can **listen and respond more effectively**
- Open Data allows people to see **Auckland Transport's performance** against our objectives
- And much more...



Insights from the journey

- As the organisation's understanding of what data and analytics can do has grown, our D&A focus has changed
- Board level and executive sponsorship, and vision from our CTO has got us to this point – they genuinely care about this stuff!
- Innovation sprints have been the key to show the “art of the possible”
 - We have run ideation workshops
 - Used 90-day innovation sprints to build out PoCs to show what can be achieved
 - Involved the business teams and partners in analytics “hackathons” to ideate
- “Data literacy” is important, but first you need the organisation to understand what the technology is capable of
- As a data and analytics leader, you need to “insert” and “assert” yourself into the conversations around how data and analytics can support the organisations strategic objectives
- But don't forget you have to:
 - **Balance the innovation with opportunity cost** – so get early engagement with stakeholders;
 - ❖ Only do enough to..... *“Get me going or stop me quick”*
 - Get even better data governance in place, as Generative AI exposes data issues more than ever
 - And implement risk management by design



A parting thought from our Gen AI hackathon....

**“Remember innovation doesn’t wait for the
‘*perfect*’ *moment*’ – it thrives when we seize
opportunities together!”**





Thank you

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