

Evidence-based decision making during Covid-19: Auckland Harbour Bridge

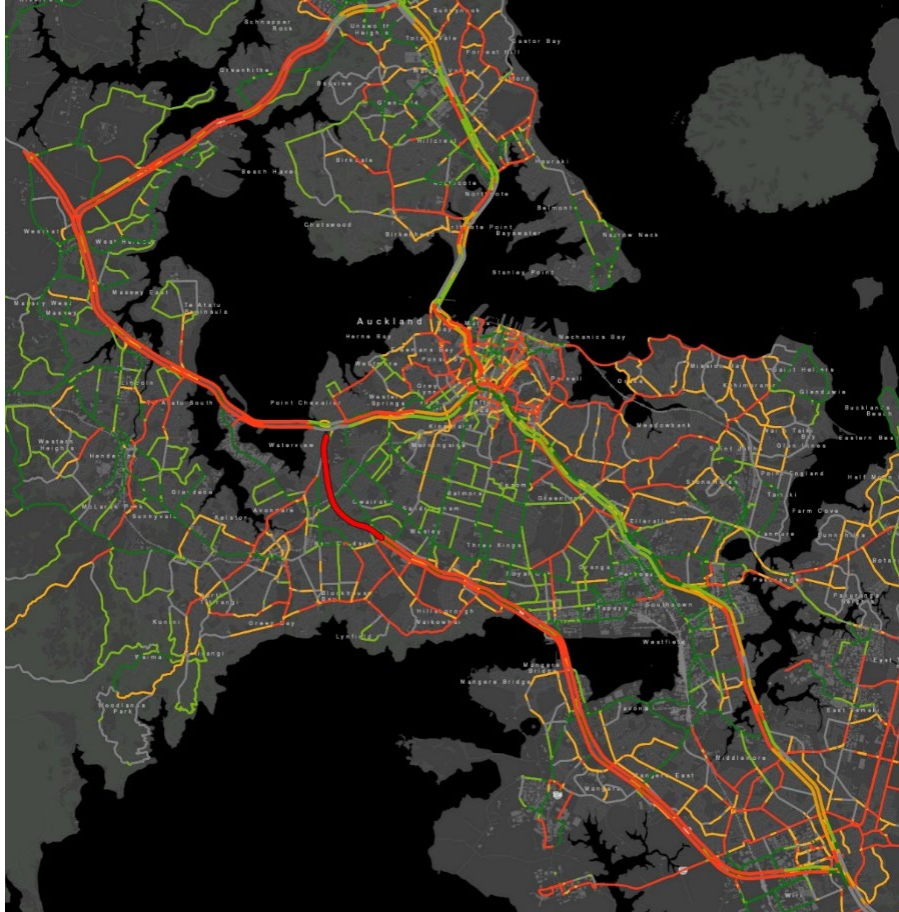
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AVIATION & FORECASTING | DATA | ECONOMICS | ENVIRONMENT | HEALTH | MĀORI | SAFETY | TECHNOLOGY & INNOVATION | URBAN

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Auckland System Management (ASM)



Auckland System Management (ASM) is an alliance that operates and maintains Auckland's motorway network.

Journey Optimisation Team

- *State Highway Traffic data collection and management services*
- *Advisory services covering recurrent / non-recurrent effects and planned / unplanned events.*

Moveable Lane Barrier (MLB) Optimisation



- Auckland Harbour Bridge; New Zealand's most valuable transport infrastructure
- Barrier moves needed to manage typical North Shore to City demand Monday to Friday



Moveable Lane Barrier (MLB) Optimisation

— Eight total lanes on the bridge. Default four lanes each.

— Barrier Machine moves the barrier at assigned times.

— One of only 15 permanent barrier move systems in the world.

— Stakeholders required **evidence -based** decision making on barrier moves through better use of data.

System Datasets and Tools We Use

DATA

- Real-time + historic traffic detector data
- TomTom Traffic Stats
- Google traffic data

TOOLS

- Power BI
- Power Apps
- Excel
- MS .NET (primarily C#)
- SQL Server

Digital Service Capabilities

- **WSP Asset and Network Performance**

- *Traffic Science + Transport Engineering*
- *Data Science (Mathematical Modelling, Statistics, ML / AI)*
- *Data Engineering (database / software development)*

- **WSP Digital Advisory**

- *Business Intelligence, IT and Data Governance, Business Analysis*

Demo

Auckland Harbour Bridge
Moveable Lane Barrier (MLB)

MLB Optimisation - Crew Communications



MLB PM Peak – Start Time

Monday, June 8, 2020

2:00pm	<input type="radio"/>
2:30pm	<input type="radio"/>
3:00pm	<input checked="" type="radio"/>
3:30pm	<input type="radio"/>

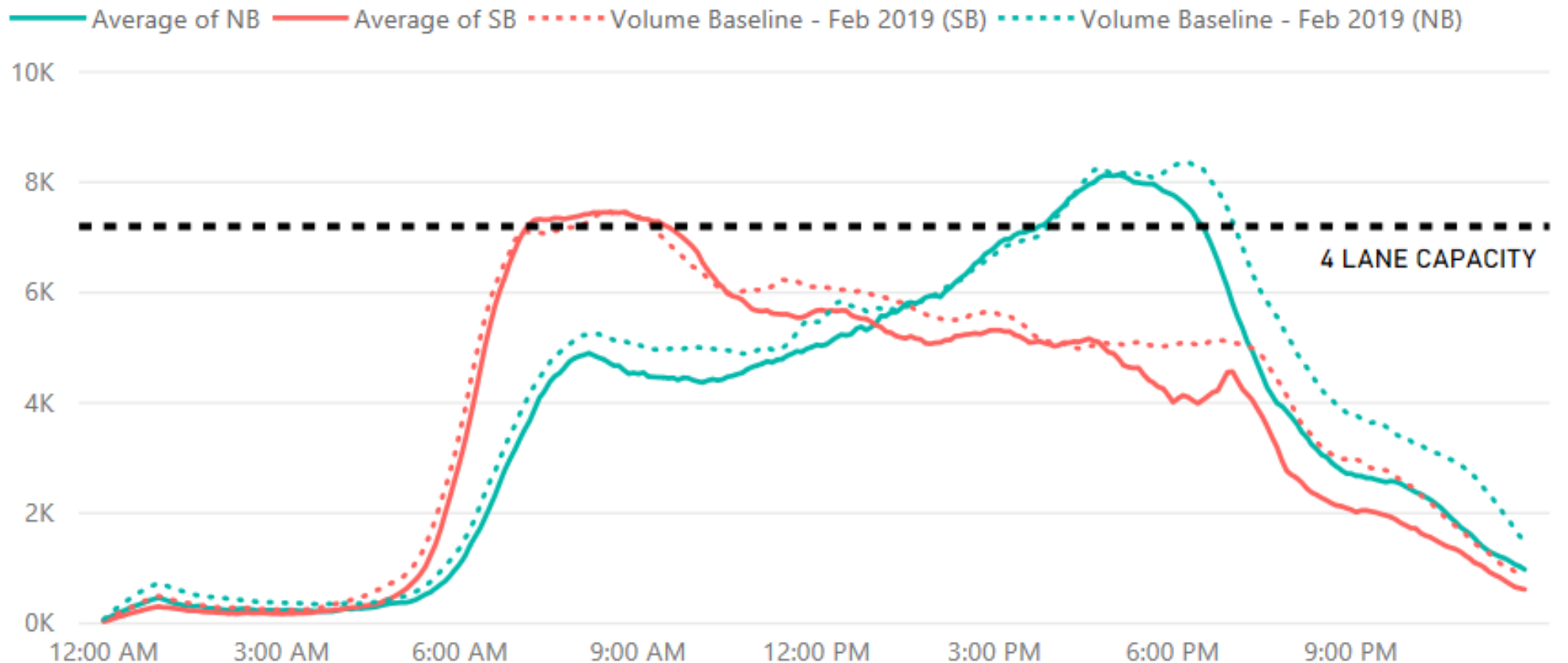
Please call ATOC to confirm MLB Start Time



Baseline values use an average of the 21st and 28th Feb 2019 as the best representation of typical network volumes for comparison as we move to COVID-19 alert level 2

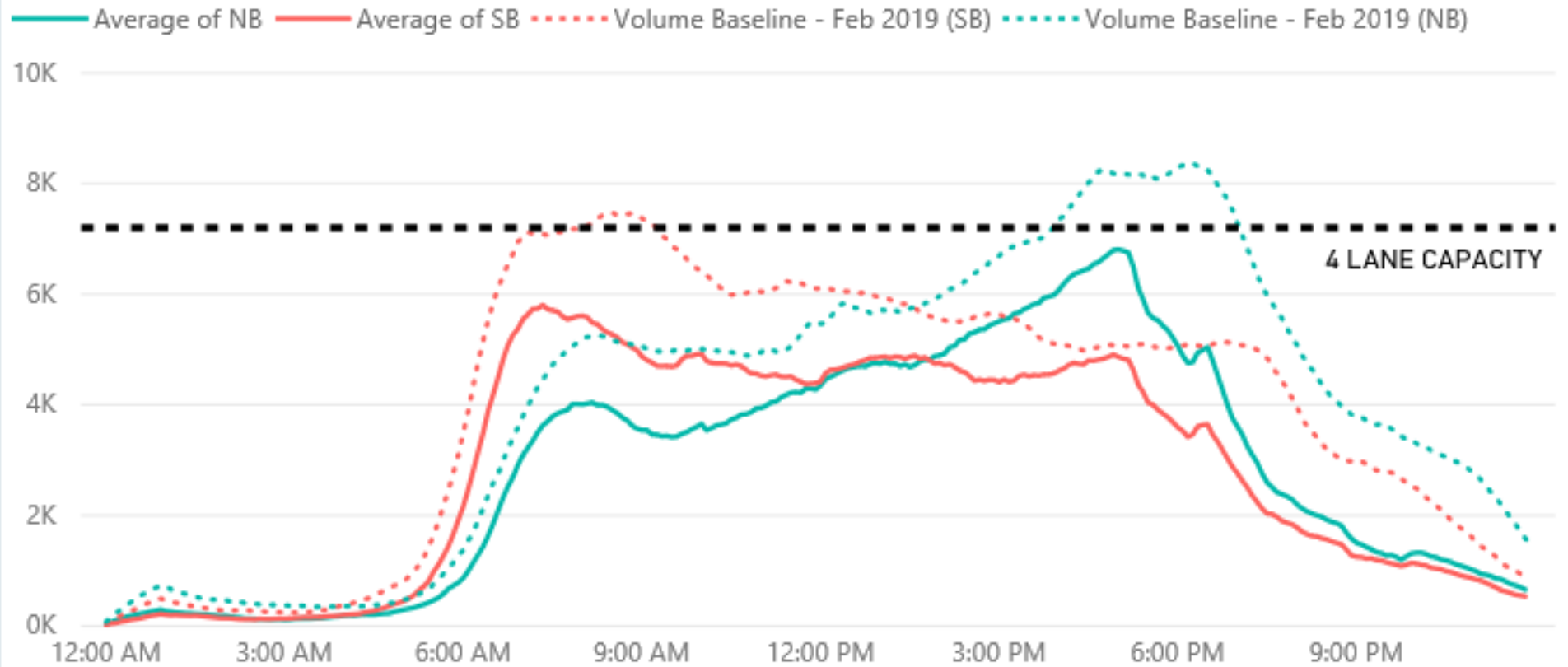
MLB OPTIMISATION - Version 0.1

Hourly Traffic Volume Averages



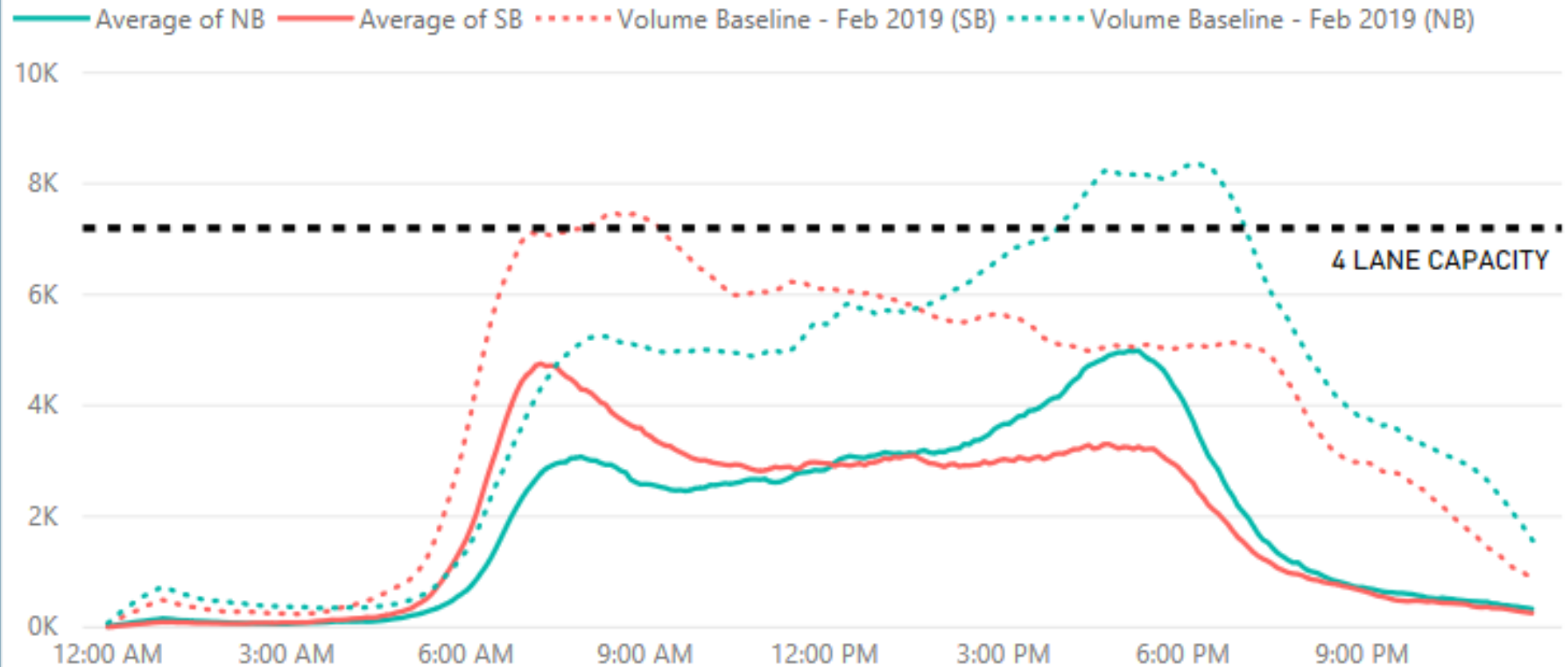
Baseline values use Wednesday the 25th March 2020 as the best representation of network volumes during COVID-19 level 3

Hourly Traffic Volume Averages



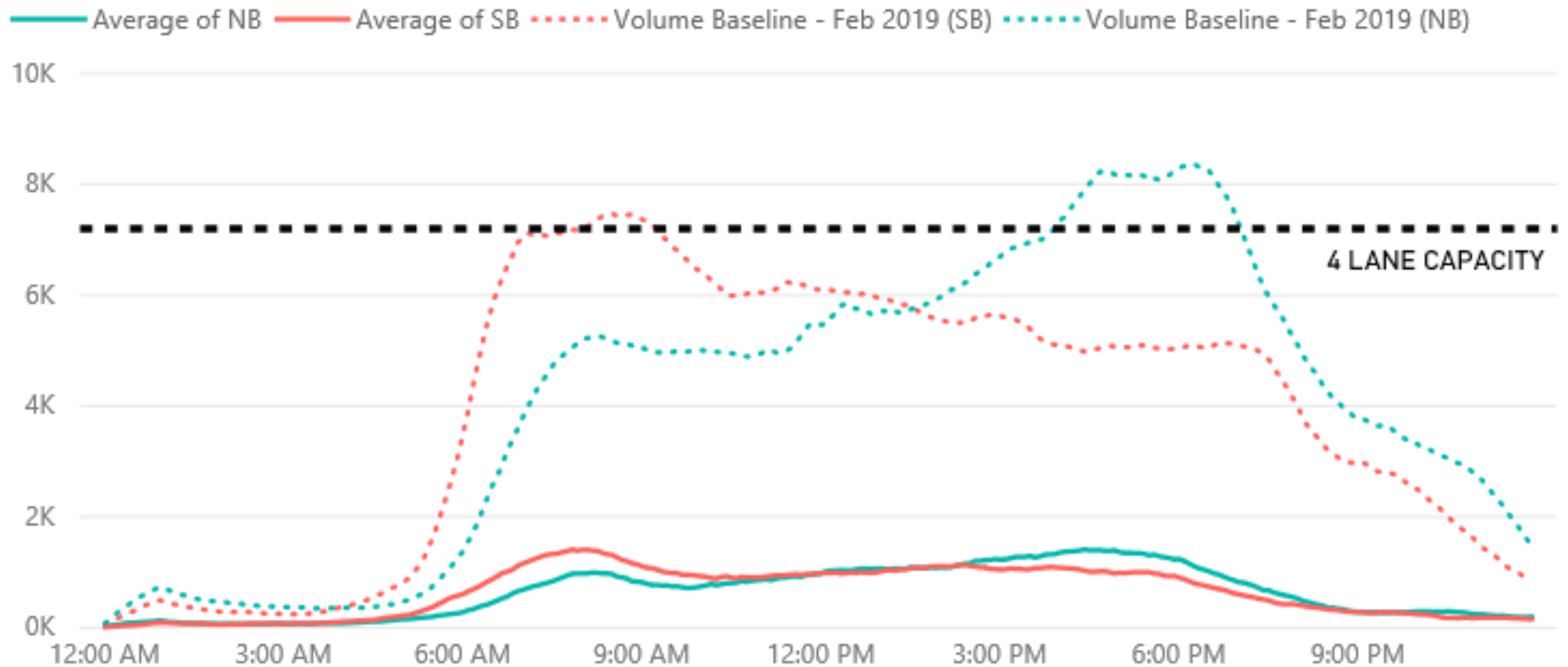
Baseline values use Wednesday the 25th March 2020 as the best representation of network volumes during COVID-19 level 3

Hourly Traffic Volume Averages



Baseline values use Wednesday the 25th March 2020 as the best representation of network volumes during COVID-19 level 3

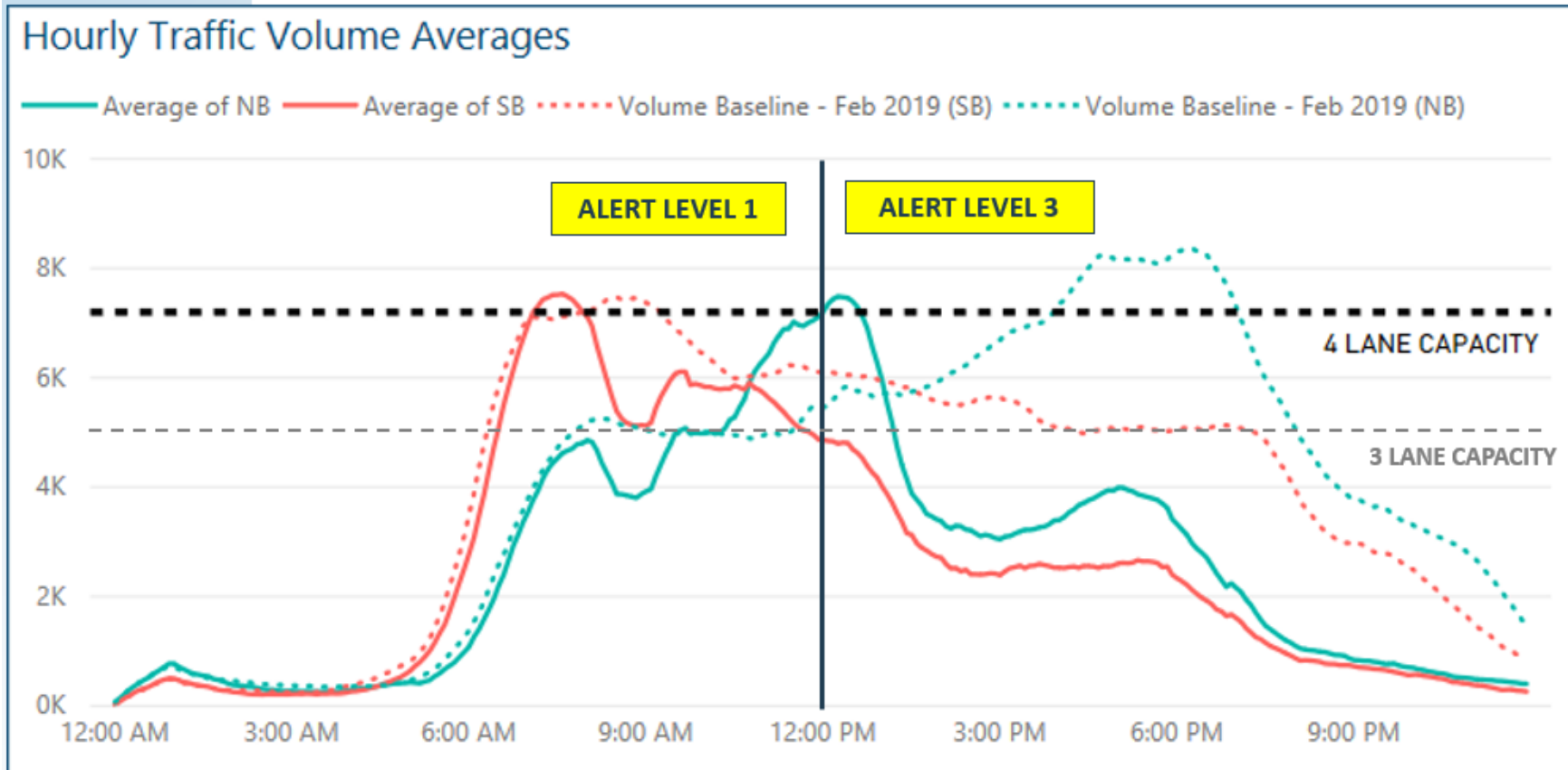
Hourly Traffic Volume Averages



Auckland Harbour Bridge Moveable Lane Barrier (MLB)

The Unexpected!

Auckland re-enters Alert Level 3 –August 12th 2020



August 11th 8pm:

NZ Prime Minister announced Auckland to move to Alert Level 3, effective at August 12th Noon.

August 12th AM:

Early morning surge in traffic

August 12th Noon:

Early peak requiring 5 lanes out, but not as big as planned.

August 12th PM:

Gradual decline in demand as Auckland entered Alert Level 3.

AHB Strut Damage from Wind Gusts

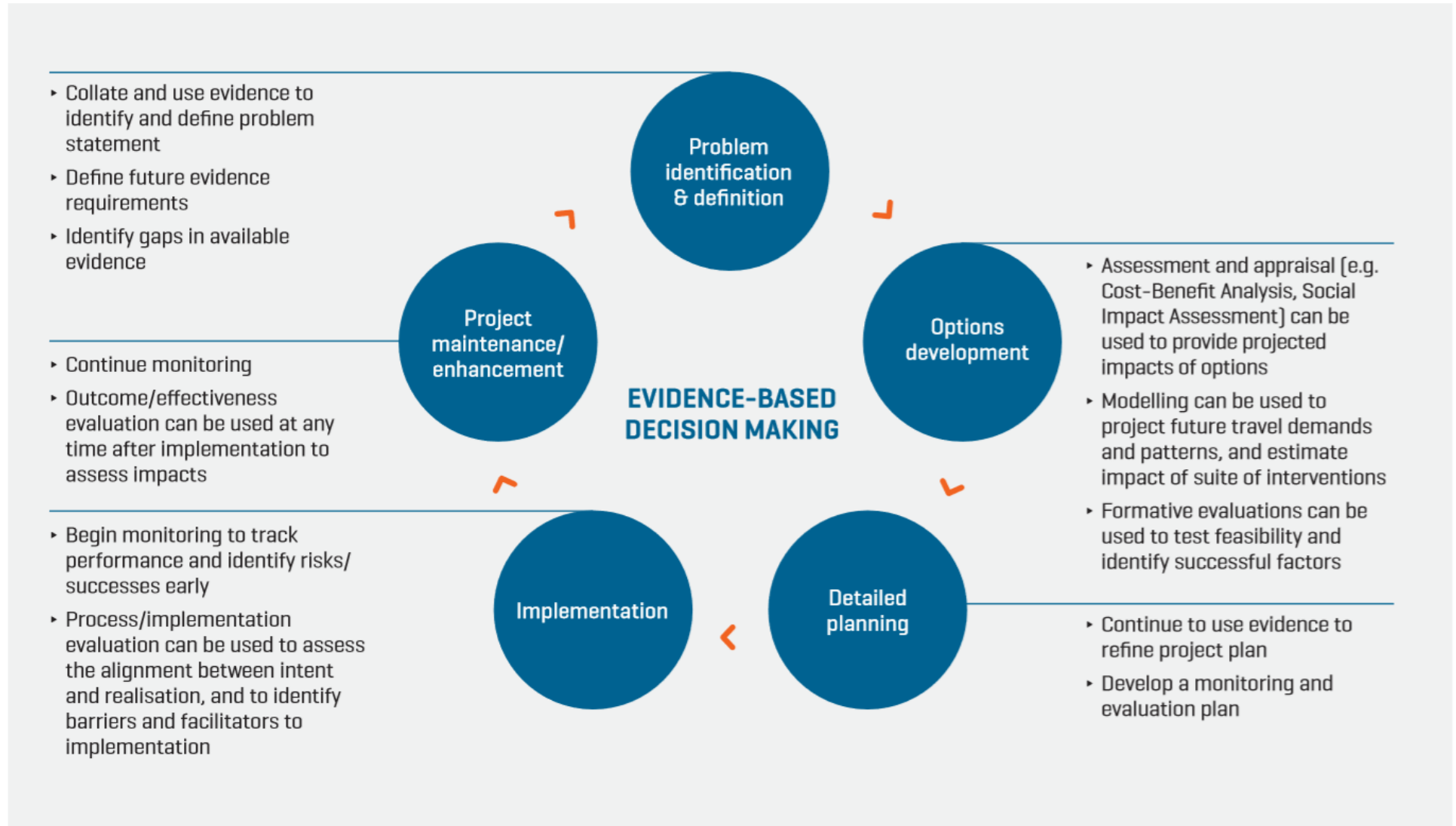
–September 18th 2020



Covid -19 Observations

1. Agility with delivery of our insights and recommendations; expect the unexpected
2. Demand is completely tied to Covid-19 Alert Levels
3. We have focused day-to-day delivery with lots more smarter insights to come as the Level 1 dataset builds up.

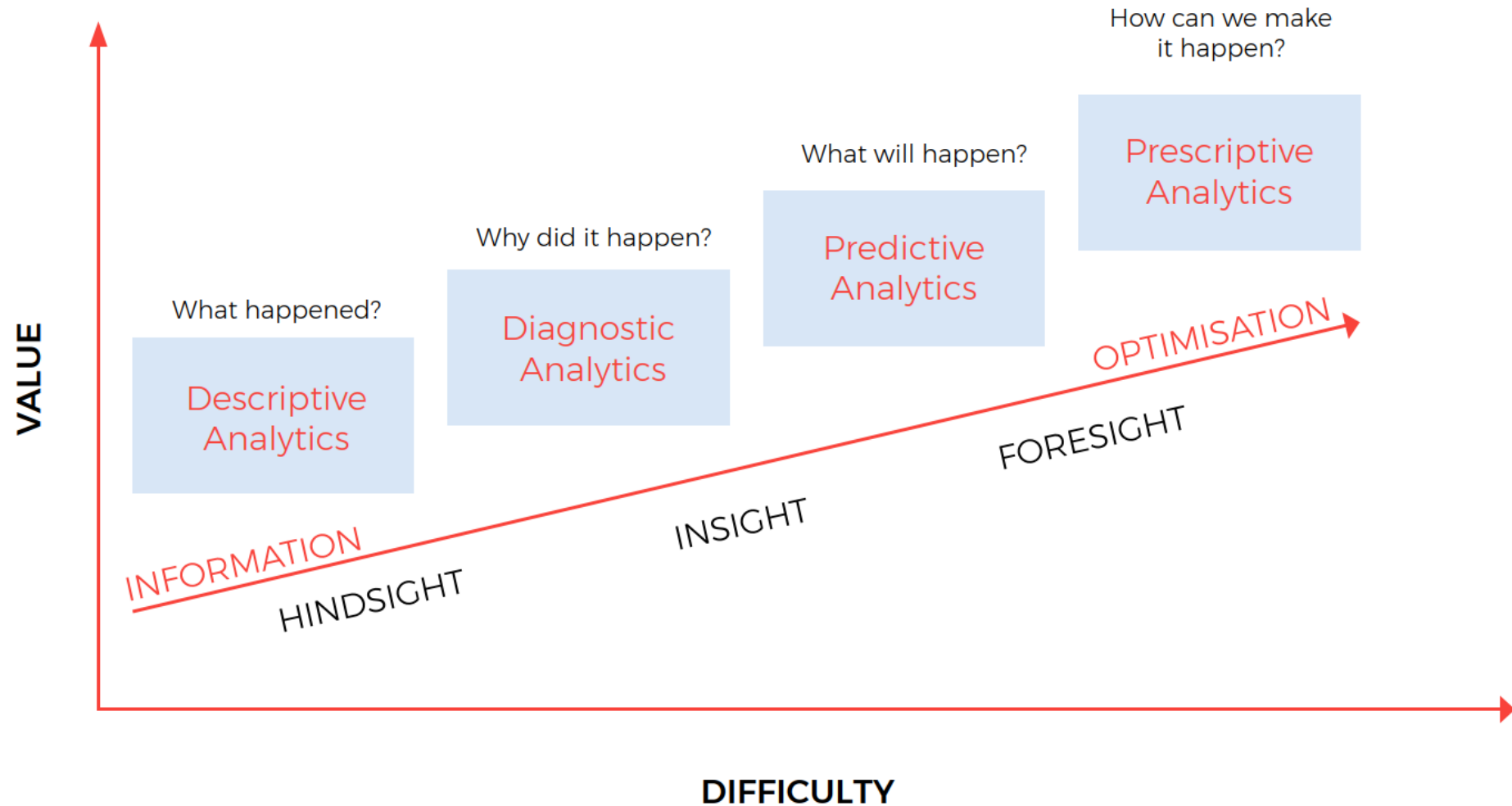
Evidence Based Decision Making



Transport Evidence Base Enablers

IMPROVE ACCESS	Open visualisation to stakeholders of key information
IMPROVE GOVERNANCE	Simple solution design, easy to adapt and govern
INVEST IN THE RIGHT ACTIVITIES	Long-term reliable journey outcomes for Aucklanders.
FACILITATE COLLABORATION	Next step Environmental, Economic and Social metrics
DEVELOP CAPACITY AND CAPABILITY	Smart solution to our MLB crew, growing confidence and ownership in the operations. Increasing use of data science.

The Smart Analytics Future



The Smart Analytics Future

Analytics	People	Policy	Process	Technology
Descriptive	Experienced Project Manager	MINISTRY OF TRANSPORT Transport Evidence Base Strategy ⁸ (TEBS) NZ TRANSPORT AGENCY Investment performance measures: benefits and measures ⁹	Basic use of SSDF and Google data	SQL Server
Diagnostic	ASM Network Performance Team – Data Scientists		Information pattern analysis	Power BI
Predictive			Data Model development	Power Apps
Prescriptive			Machine Learning	R, Python
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In Summary

- **Covid -19 presented huge challenges for us.**

Yet we have generated practical transport knowledge for stakeholders and the road sector.

- **Evidence Base Strategy is vital to our success.**

Aligning to the strategy helped achieve better outcomes for stakeholders and road customers.

In Summary

- Our teams have a technical plan and offerings that are **future ready** : “The Smart Analytics Future” white paper

<https://www.wsp.com/en-NZ/insights/the-smart-analytics-future>

Questions?

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