



# USING A SAFETY CAMERA SYSTEM (SCS) TO LOWER MEAN SPEEDS AND IMPROVE COMPLIANCE

Detailed Business Case – Appendices

November 2022

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## APPENDICES

### Appendix 1 Role of speed in deaths and serious injuries

**Table 1: Casualties from all road crashes and where excess or inappropriate speed was identified as a contributing factor, 2011–2020**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Deaths</b>										
Total road deaths	284	308	253	292	317	327	378	378	350	320
Speed main factor for road deaths	84	85	85	85	104	97	103	116	96	113
% of road deaths, speed is factor	30%	28%	34%	29%	33%	30%	27%	31%	27%	35%
<b>Serious injuries</b>										
Total serious injuries	2,088	2,102	2,022	2,074	2,166	2,548	2,862	2,600	2,510	2,713
Speed main factor for serious injuries	469	419	446	460	523	542	667	551	499	508
% of serious injuries, speed is factor	22%	20%	22%	22%	24%	21%	23%	21%	20%	23%
<b>Minor injuries</b>										
Total minor injuries	10,588	10,118	9,912	9,229	10,182	10,233	11,177	12,098	12,243	10,663
Speed main factor for minor injuries	1,686	1,536	1,474	1,497	1,872	1,844	1,996	2,164	2,083	2,024
% of minor injuries, speed is factor	16%	15%	15%	16%	18%	18%	18%	18%	17%	19%



## Appendix 2 Safety cameras overview

The main types of safety cameras – red-light or dual function red-light–speed cameras, average speed (point-to-point) cameras, static (fixed) cameras, and mobile cameras are described briefly below.

Type of camera	Description
Red-light or dual function red-light–speed safety cameras 	<p>A red-light camera system typically uses radar or laser to track and capture vehicles running a red light. The primary radar or laser scans and tracks vehicles as they approach the intersection. If a vehicle crosses the stop line during a red-light phase, a camera photographs the rear of the vehicle. A second radar or laser (used for validation) ensures the photograph taken is of the breaching vehicle.</p> <p>Dual function cameras are capable of recording vehicles that run red lights or speed through intersections or both.</p> <p>Predicted effectiveness in reducing DSIs per year: 26%</p>
Average speed (point-to-point) safety cameras 	<p>Average speed safety cameras calculate and record a vehicle's average speed between two points along a stretch of road.</p> <p>Infringement notices are issued only if the average speed over the entire distance exceeds the legal limit. This gives an accurate reading of whether drivers are speeding over a sustained distance, rather than just at a single point.</p> <p>Predicted effectiveness in reducing DSIs per year: 48%</p>
Static (fixed) safety cameras 	<p>Static (fixed) safety cameras are the ones most people currently experience.</p> <p>These cameras use a dual radar or laser system. Signals reflect off vehicles and back to the camera. One radar or laser identifies speeding vehicles by measuring vehicle speed three times in quick succession and taking the middle speed. The second identifies the lane the vehicle is in and double-checks the speed reading. If the vehicle is speeding, the camera takes a picture.</p> <p>The camera is also able to differentiate between vehicles such as heavy trucks and cars, which have different speed limits. An infrared flash enables number plate information to be captured in the dark.</p> <p>Predicted effectiveness in reducing DSIs per year: 15%</p>
Mobile safety cameras 	<p>Mobile safety cameras are cameras that are housed inside a van, allowing the system to be mobilised across the network.</p> <p>The cameras include a radar or laser system that measures vehicle speed and a flash for night-time photography.</p> <p>Traffic camera operators run the camera equipment from inside the vehicles and can observe any images taken and adjust image quality when required. They cannot alter any of the settings or the speed at which a camera system takes a photograph.</p> <p>Predicted effectiveness in reducing DSIs per year: 11% (rural) – 23% (urban).</p>

## Appendix 3 Investment logic map

A facilitated investment logic mapping workshop was held between 6 and 20 October 2021 with key stakeholders. This appendix contains the main output from the workshop: an investment logic map (Figure 1). The map was revised and updated during Detailed Business Case development (Figure 2).

Figure 1: Original investment logic map for the SCS Programme, Indicative Business Case

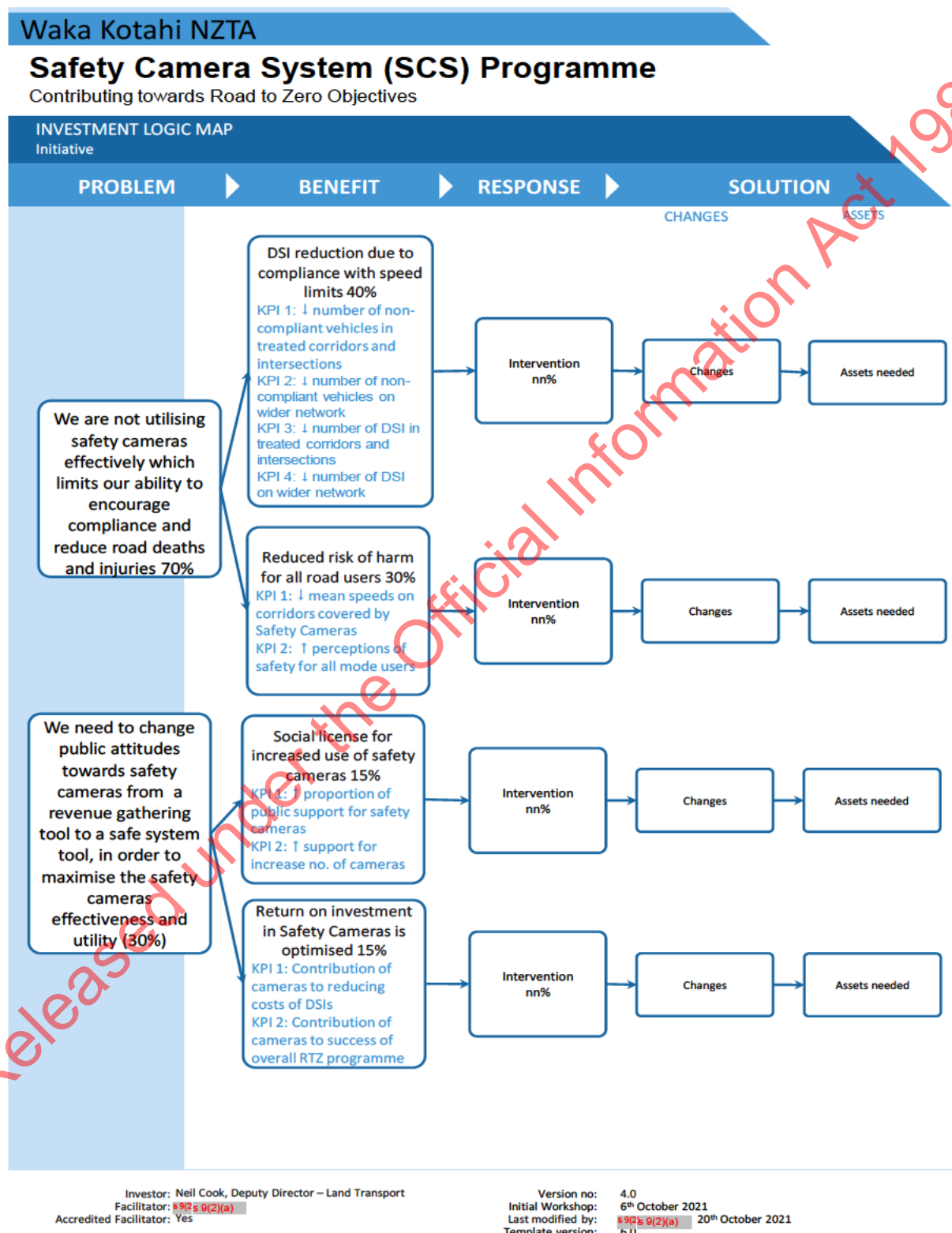


Figure 2: Updated investment logic map for the SCS Programme, Detailed Business Case

DEPARTMENTNAME: Waka Kotahi (NZTA)

## Using a Safety Camera System (SCS) to Reduce Speeding(including Red Light running)

Contribute towards Road to Zero Objectives

### INVESTMENT LOGIC MAP

Initiative

#### PROBLEM

The SCS uses old, manual technology and has limited geographic coverage which significantly reduces and delays ability to encourage road speed compliance 80%

The NZP SCS is at end of life, creates perceptions of revenue gathering and is not compatible with the WK SCS, continuing it will increase total costs, and reduce effectiveness and efficiency opportunities 20%

#### BENEFIT

**Road users are safer through lower mean speeds**  
100%

KPI 1: Fewer speeding vehicles (includes red light running) in treated corridors and intersections

KPI 2: Reduced mean speed on roads across NZ

KPI 3: Increase percentage of the general public who agree that safety cameras are an important intervention to reduce the number of speeding vehicles

KPI 4: Increased percentage of the public who agree that they are likely to get caught when driving over the posted speed limit

#### RESPONSE

Establish, in stages, a single SCS with expanded and enhanced capability to reduce speeding (include red light running) and overall average speed, beginning with high risk areas first. 100%

#### SOLUTION

CHANGES

ASSETS

Transfer and consolidate (for efficiency) NZP SCS role into the new, enhanced and expanded WK SCS

Develop an automated (where possible) SCS including end to end processing of infringements and prosecutions, and utilises a continuous improvement model

Ensure the SCS is integrated with the other RtZ programmes to optimise safety outcomes:  
Infrastructure and speed  
Vehicle safety  
Work related road safety  
Road user choices  
System management

Legislative change to enable Average speed cameras

Mobile Cameras  
Fixed Cameras  
Red light Cameras

IT Network that connects cameras to back office systems

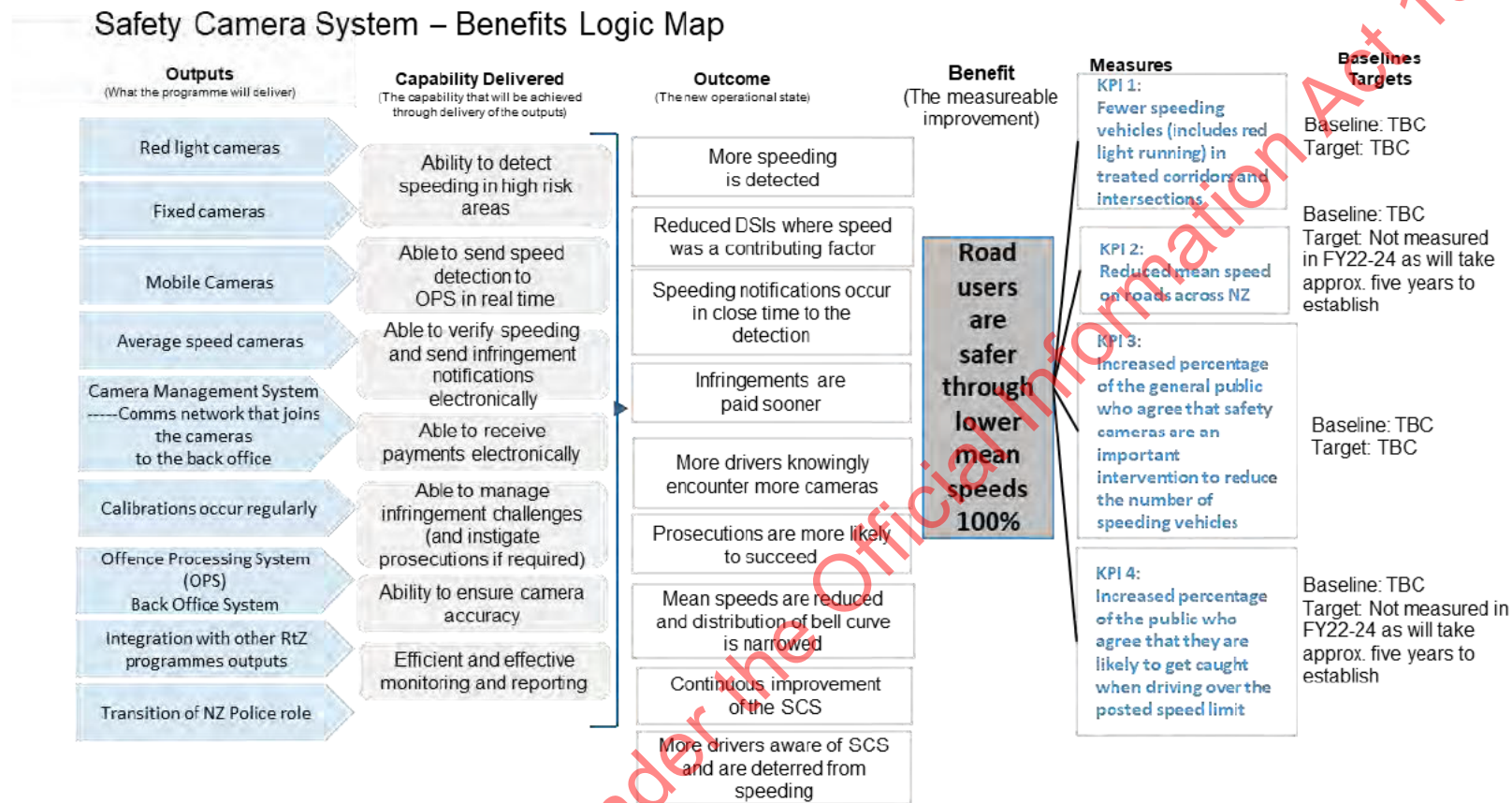
IT back office systems that manage verifications and infringements

Average Speed Cameras

Investor: Kane Patena  
Facilitator: § 9(2)(a)  
Accredited Facilitator: Yes

Version no: 1  
Initial Workshop: May 2022  
Last modified by: § 9(2)(a)  
Template version: 6.0

Figure 3: Benefits logic map



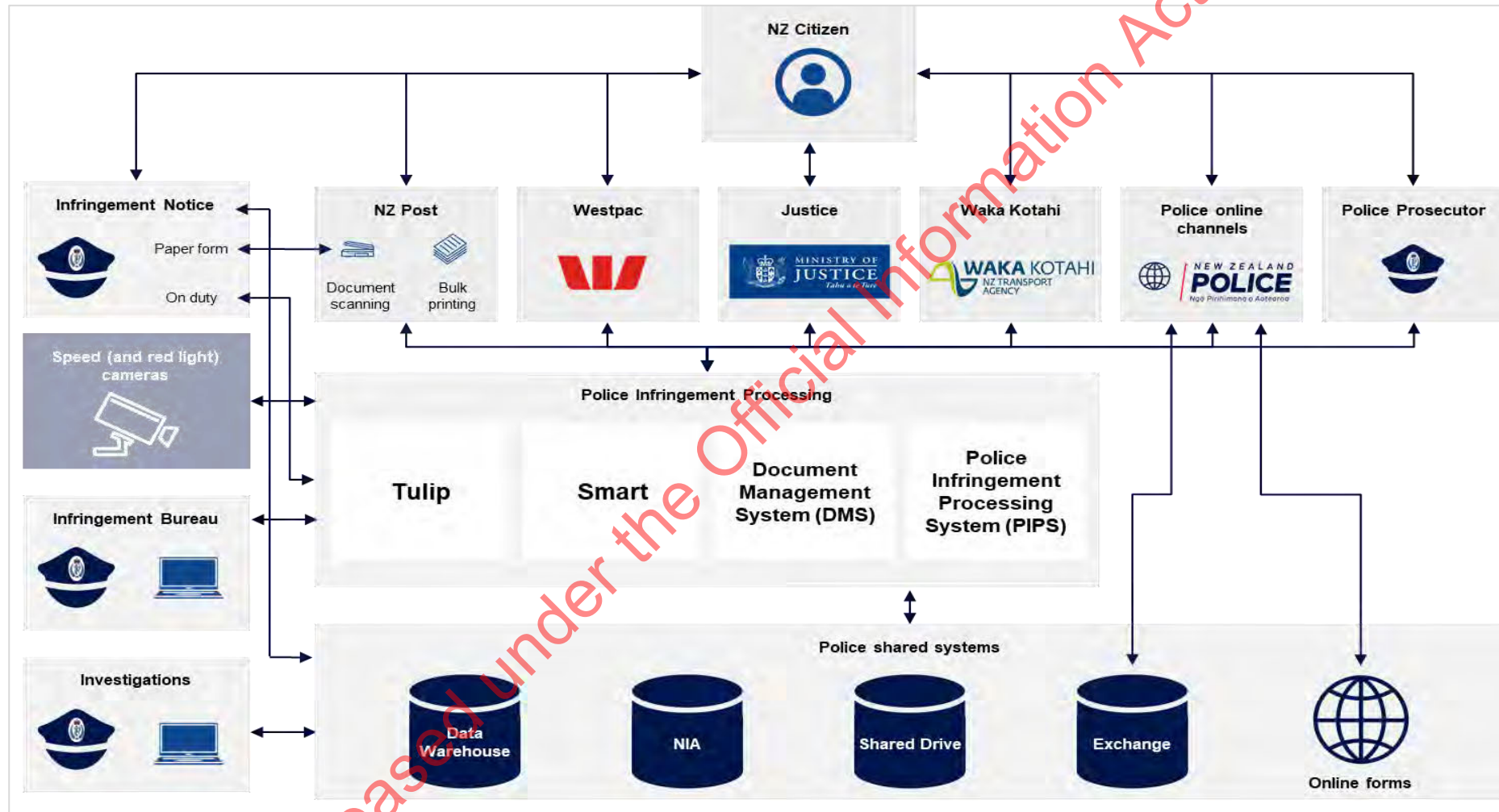
#### Scope for Stage 1 FY22-24

- 100 NZ Police cameras transferred
- Auckland Transport cameras
- Expansion cameras
- Calibration service
- Camera Management System that can be scaled as required
- Offence Processing System that can be scaled as required
- Integration with RtZ programmes
- Continuous improvement established



## Appendix 4 Police Infringement Processing System – high-level overview

The Police Infringement Processing System (known as PIPS) is at end of life.



## Appendix 5 New Zealand Police's vision

Illustrated below is the New Zealand Police vision.



Source: New Zealand Police. 2020. *New Zealand Police Statement of Intent 2020–2025*. Wellington: Author.



## Appendix 6 Internal stakeholders relevant to the investment in SCS

Internal stakeholder	Focus
Board	Is interested in how safety cameras will help to deliver DSI reductions, what the overall investment will be and what their options are. Approves programme funding through business cases
Waka Kotahi Chief Executive	Is interested in how safety cameras will help to deliver DSI reductions, what the overall impact on the organisation will be, and what the options are. Impacted Police staff will be interested to know who their new chief executive might be and what they are like
Executive Leadership Team	Is interested in how safety cameras will help to deliver DSI reductions, what the overall impact on the organisation will be and what the options are. Will make decisions that have organisation-wide implications, for example, high-level organisation design
Road to Zero Executive Leadership Sub-committee	Is accountable for delivery of DSI reductions from safety cameras
Director of Land Transport & General Manager Regulatory Services	Is accountable for delivery of the SCS Programme
Deputy General Manager	Is the Business Owner for the SCS Programme and accountable for delivery of outcomes
Senior Manager, Road Safety	Is accountable for delivery of outcomes
Road to Zero Portfolio Director	Is interested in ensuring the programme delivers the outcomes expected
Speed and Infrastructure Programme	Is coordinating and delivering SNP (state highways and local roads). Has a speed management planning role and road controlling authority interface re camera expansion. Is responsible for detailed site design and construction of camera sites
Speed Management Framework Programme	Is implementing a new framework for developing and approving speed management plans. Has a link to the Safety Camera Management Programme in terms of approved speed limits that must be enforced on safety cameras and incorporating the locations and effects of safety cameras on speed management planning
Transport Services – Safety Engineers, Safe and Sustainable Standards – Road Safety	Are responsible for Safety camera placement and guidance
Transport Services – Maintenance and Operations	Undertakes operations and maintenance of the state highway network. Will be responsible for camera siting through the NOC Management of professional and physical work services
Lead Advisor, Safety	Undertakes policy development and thought leadership when it comes to technical delivery for state highways
E&P – Regulatory Services Practice Manager	Leads the Regulatory Services communications team
E&P – Media, Government Services, C&E	Needs to be familiar with the programme and key messaging – key channel for media and official correspondence, good links into other programmes of work and channels of communication


Internal stakeholder	Focus
E&P – Directors Regional Relationships	Need to be familiar with the programme and key messaging, specifically those actions that require councils/road controlling authorities to work differently. Has strategic oversight of transport system development
E&P – Education and Advertising	Is responsible for delivery of the Waka Kotahi national road safety advertising and associated education programmes. Is leading safety camera campaign development and delivery
Corporate Support – Risk and Assurance	Ensures the risk profile of programme is managed appropriately
Corporate Support – Organisational Performance	Ensures Waka Kotahi is meeting and reporting on its SPE deliverables
Regulatory – Contact Centre staff	Are the interface with the public – take customer calls on any Waka Kotahi related topic, general information and where to go for more information, including email correspondence via official correspondence team
Finance OPPP	Funding and cashflow requirements and investment accountability
GM People	Is accountable for people change and transfer process
People – ER	Is the key interface with unions/direct approach with unions
People – Rem/Org Capability/Business Partners	Is responsible for people change and organisational development
Enterprise Change	Is a specialist helping Waka Kotahi deliver change internally and with the sector
Portfolio Change Lead, Regulatory Services	Oversees Regulatory Services Change
Portfolio Director, Regulatory	Oversees Regulatory Services portfolio on behalf of Enterprise Change
Regulatory Services – Intelligence	Is responsible for data and intelligence for Regulatory Services
Regulatory Services – Risk and Assurance	Is responsible for assessing risk for Regulatory Services
Regulatory Services – Regulatory Policy	Writes policy (for example, to enable point-to-point cameras)
Regulatory Services – Operational Policy	Understands business process for new functions
Māori Partnerships team	Provides advice and guidance to Waka Kotahi
Safety Camera Programme Advisory Board	Provides advice and guidance over programme thinking and design
Safety Camera Steering Committee	Is a Waka Kotahi–Police governance committee
Digital Portfolio Group (Te Hau Ora)	Is responsible for governance across all digital initiatives across Waka Kotahi
Chief Technology Officer	Is accountable for all technology implementation
General Counsel	Advises on legal process – programme needs to consult and follow advice
Corporate Property	Will store safety cameras and other assets transferring from Police. Assigns location and technology to new personnel. Security measures?

Internal stakeholder	Focus
Financial Operations	Processes infringements
Finance OPPP	Needs to be assured the programme is accountable for funding
Business Support	Comprises the front-line and support staff impacted on by the functions and people coming into the organisation Deals with safety concerns from front-line staff with respect to new infringements impacts
Research & Analytics	Is interested in the customer journey – programme may need to engage for research and data purposes
Information Management	Is responsible for archiving, Infohub, library services, and file management
Procurement	Procures safety cameras and other assets/technology as required

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## Appendix 7 Proposed benefit profile

Benefit	Road users are safer through lower mean speeds (100%)
Benefit Owner: Neil Cook	Benefit type: Non-financial
KPI 1	<p><b>KPI 1: Fewer speeding vehicles (includes red light running) in treated corridors and intersections</b></p> <p><b>This KPI will have two measures:</b></p> <ul style="list-style-type: none"> <li>• <b>Measure 1: Ratio of number of vehicles passing a camera to number of speeding vehicles</b></li> <li>• <b>Measure 2: Distribution on a bell curve of speed above the posted limit for speeding vehicles</b></li> </ul>
Deliverable/s that directly contribute	<p>Develop an automated (where possible) SCS including end to end processing of infringements and prosecutions, and utilises a continuous improvement model</p> <p>Transfer and consolidate (for efficiency) Police SCS role into the new, enhanced and expanded Waka Kotahi SCS</p> <p>Roll out the 139 Police cameras and s 9(2)(g) expansion cameras</p>
Baseline	<p>Number of speeding vehicles to be established from the Speed Survey</p> <p>Currently Waka Kotahi has none of the Police cameras</p> <p>Currently no expansion cameras.</p> <p>Ratio of non-speeding to speeding vehicles in the treated areas – unknown but should be tracking down over time for each camera.</p> <p>Alternatively, rolling average of speeding detections per camera and overall should be tracking down over time.</p> <p>Note: Assumes the ICT and people capable to manage the processes are present.</p> <p>Distribution of speeding vehicles over the posted limit is unknown but should be tracking down over time.</p>
Target	<p>By 30 June 2024, for treated areas:</p> <ul style="list-style-type: none"> <li>• s 9(2)(g)(i)</li> <li>• s 9(2)(g) expansion cameras have been rolled out with supporting processes and ICT</li> <li>• the trend is of a decreasing ratio or rolling average of speed detections</li> <li>• the trend is of speeding vehicles being at lower speeds above the posted limit.</li> </ul>
Frequency	The dashboard will (preferably) have an anywhere, anytime capability for authorised users, including the Governance Group. Progress reports will part of each Governance Group meeting.
Start of measurement	As soon as rollout begins in FY2022, once the first camera is in operation.
End of measurement	Ongoing, with detailed analysis at end of stage 1 and end of each subsequent stage.
Realisation schedule	Iterative and accumulative throughout stage 1.
Data source	<p>Annual Speed Survey</p> <p>Programme progress reporting</p> <p>Data from SCS ICT database (metadata)</p>
Data Owner	TBC

Benefit	Road users are safer through lower mean speeds (100%)
Attribution	Solely attributed to the change
Dependencies	Requires legislative change for the introduction of average-speed cameras.
Assumptions/notes/risks	
KPI 2	KPI 2: Reduced mean speed on roads across NZ (whole road network)
Deliverable/s that directly contribute	<p>Develop an automated (where possible) SCS including end to end processing of infringements and prosecutions, and utilises a continuous improvement model</p> <p>Transfer and consolidate (for efficiency) Police SCS role into the new, enhanced and expanded Waka Kotahi SCS</p> <p>Rollout of the 139 Police cameras and the  expansion cameras</p> <p>Ensure the SCS is integrated with the other Road to Zero focus areas to optimise safety outcomes</p> <ul style="list-style-type: none"> <li>• Infrastructure and Speed</li> <li>• Vehicle Safety</li> <li>• Work-related Road Safety</li> <li>• Road User Choices</li> <li>• System Management</li> </ul>
Baseline	Will establish baselines from previous Speeding Surveys
Target	Measurable difference is not expected by July 2024.
Frequency	Annual
Start of measurement	As soon as rollout begins but with no expectation of change in first two years (but will establish a two-year baseline)
End of measurement	Ongoing with first detailed analysis at end of Stage 2
Realisation schedule	Annual
Data source	<p>Annual Speed Survey</p> <p>Data extracted from the Camera Management System and Offence Processing System</p>
Data Owner	TBC
Attribution	Attribution may be due to other Road to Zero interventions. This will be determined using multivariate analysis at the end of Stage 1.
Dependencies	Other Road to Zero interventions may be a contributing factor
Assumptions/notes/risks	
KPI 3	KPI 3: Increase percentage of the general public who agree that safety cameras are an important intervention to reduce the number of speeding vehicles
Deliverable/s that directly contribute	<p>Ensure the SCS is integrated with the other Road to Zero programmes to optimise safety outcomes</p> <ul style="list-style-type: none"> <li>• Infrastructure and Speed</li> <li>• Vehicle Safety</li> <li>• Work-related Road Safety</li> <li>• Road User Choices</li> <li>• System Management</li> </ul>
Baseline	TBC from Public Attitudes Survey



Benefit	Road users are safer through lower mean speeds (100%)
Target	All the general public see the SCS as a means to reduce the number of speeding vehicles
Frequency	Reported annually
Start of measurement	As soon as rollout begins
End of measurement	Ongoing with detailed analysis at end of stage 1 and end of each subsequent stage
Realisation schedule	Annual
Data source	Public attitude survey
Data Owner	TBC
Attribution	SCS and other Road to Zero interventions
Dependencies	Road to Zero Programme
Assumptions/notes/risks	
<b>KPI 4</b>	<b>KPI 4: Increased percentage of the public who agree they are likely to get caught when driving over the posted speed limit</b>
Deliverable/s that directly contribute	<p>Ensure the SCS is integrated with the other Road to Zero programmes to optimise safety outcomes</p> <ul style="list-style-type: none"> <li>• Infrastructure and Speed</li> <li>• Vehicle Safety</li> <li>• Work-Related Road Safety</li> <li>• Road User Choices</li> <li>• System Management</li> </ul>
Baseline	TBC from Public Attitudes Survey
Target	<b>All public agree speeding is more likely to be detected</b>
Frequency	<b>Annual</b>
Start of measurement	As soon as rollout begins but with no expectation of change in first two years (but will establish a two-year baseline)
End of measurement	Ongoing, with first detailed analysis at end of stage 2
Realisation schedule	<b>NA</b>
Data source	Public Attitude Survey
Data owner	<b>TBC</b>
Attribution	<b>SCS and other Road to Zero interventions</b>
Dependencies	<b>Road to Zero programme</b>
Assumptions/notes/risks	



## Appendix 8 Qualitative benefits

The contribution of the Safety Camera System (SCS) to the Road to Zero (RtZ) death and serious injury (DSI) reduction targets, resulting from reduced speeds on treated corridors and intersections are the core of the expected monetary and non-monetary benefits.

Benefit recommendations can be discarded early in the definition phase when they are viewed as non-core to the investment objectives of the programme. These benefits are typically either qualitative in nature – or direct attribution to SCS enablers is viewed as tenuous.

Qualitative benefits are neither absent, nor insignificant. Aggregated, these provide sizeable benefit to New Zealanders, road users, as well as the broader NZ economy:

- reduced emissions
- network efficiency
- improved processes
- emergency response
- cost avoidance
- overall network safety

### *Reduced emissions*

The potential to improve vehicle emissions from vehicles on treated corridors and intersections will be positively impacted as a result of the SCS interventions. Non-uniform speeds, acceleration, braking and excess speed all contribute to the range of emissions which Waka Kotahi has signed up to proactively improve.

Under these considerations, the SCS Programme has a strong likelihood of contributing to these improvements. The improvements to the above should result from over the 20 years to 2042.

To what extent, and how attributable these improvements are to the SCS Programme is more difficult to quantify. Additional external factors such as improving the NZ vehicle fleet, road controlling authority programmes, and other speed management initiatives confound the results likely attributable to SCS.

### *Improved processes*

Improved processes are, in part, a dependency for realising the benefits identified in the investment logic mapping workshops. Process efficiencies can result in ability to increase per-camera operating hours, increased throughput of infringement notices, and improved customer service and satisfaction.

International studies also show that reducing the time from a non-compliance event to receipt of infringement notification drive increased compliance from road users. Improved processes have potential to increase cumulative DSI reductions, as well as further securing social licences for the safety camera programme.

### **Emergency response**

Deploying safety cameras expects to reduce (at a minimum) 120–140 road crashes per year.<sup>1</sup> The key assumption is that each DSI crash requires the attendance of emergency services to the scene.

Removing the need to attend as many scenes, in turn, provides the ability to improve the allocation of these scarce resources. Whether attending non-roading emergency incidents or other critical activities, NZ's emergency service system benefits from the reduced number of crashes facilitated by the SCS Programme.

### **Network efficiency**

Crashes introduce disruptions into the roading system – depending on the location and time of day, week, or year these disruptions can be significant. As argued above, the SCS Programme's and RtZ's considerable reduction of accidents and crashes (site dependent) lead to a smoother-running network.

These potential improvements have not been evaluated or quantified. The programme agrees that network efficiency isn't the basis for the investment decision in the SCS. If network efficiency benefits can be directly attributable to the programme, details will be developed to measure and accrue these benefits.

### **Cost avoidance**

It is unclear whether potential cost avoidance has been confirmed. Cost avoidance benefits are typical from programmes such as the SCS Programme and can be considerable. Such benefits accrue in the broader system. In the case of SCS will be the reduced capital and operational requirements – Police being the beneficiary.

Reducing the Police overhead and capital requirements of operating the (approximately 135) cameras will result in adjustments to Police budget lines. Budgetary (and non-budgetary) cost avoidance should be considered as it is likely directly attributable to the SCS Programme.

### **Overall network safety**

Benefits highlighted in the investment logic mapping workshops rightly focus on reducing speeding, which, in turn, reduces DSIs. The ability to drive compliance against safety factors such as use of restraints and cellphones has potential to further reduce serious crashes and associated DSIs. These benefits have been included under the catch-all 'contribution of cameras to success of overall RtZ programme' benefit. Further work will be required to elaborate the measurement and baselining for overall network safety benefits.

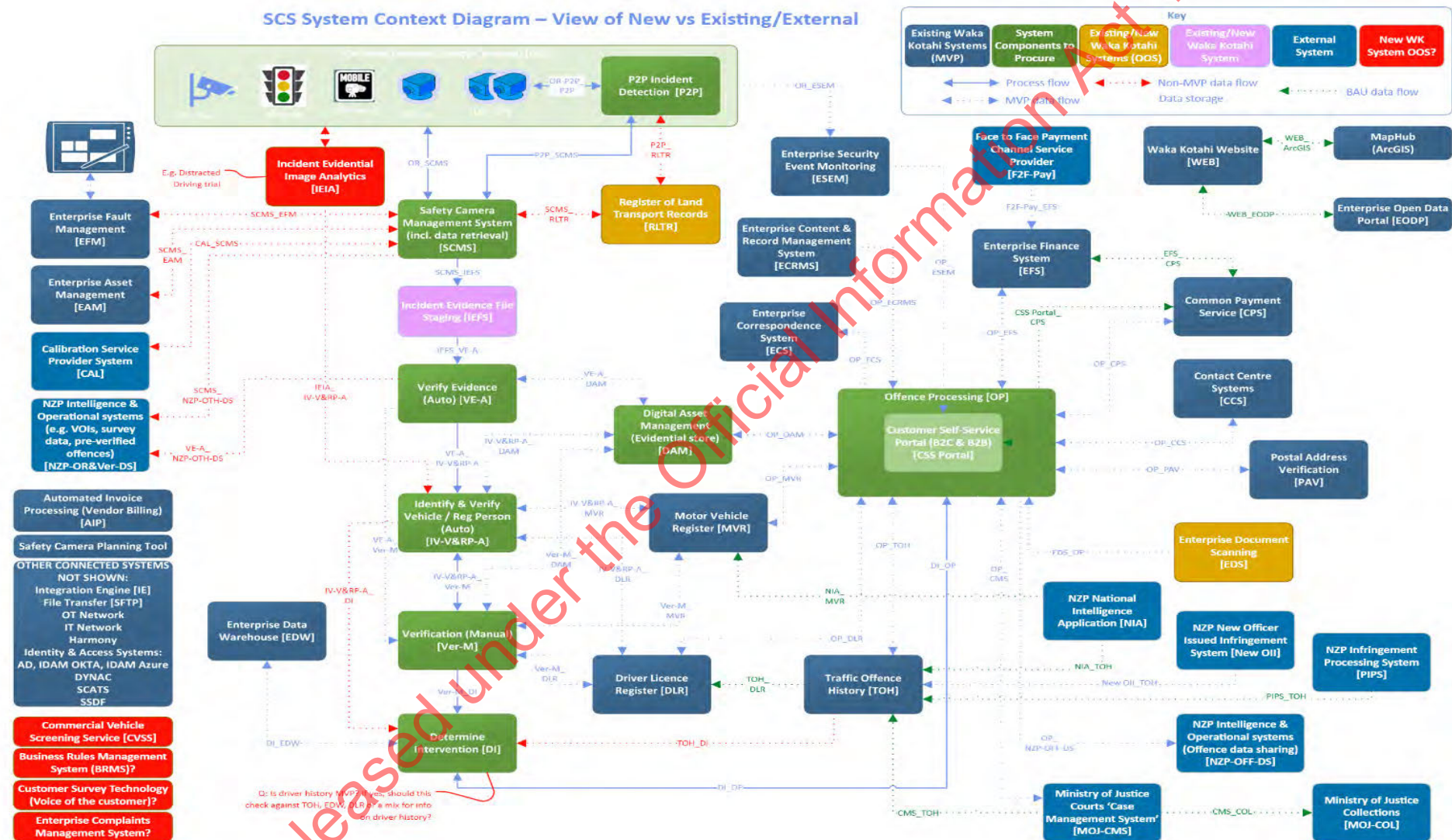
s 9(2)(f)(iv)

, as well as driving overall network safety benefits in its own right.

<sup>1</sup> These are just the DSI-related crashes, it is likely there are additional crashes where emergency services are deployed. Once the cameras are fully deployed (July 2020); that is, assuming a fully deployed network of s 9(2)(g) (existing plus expanded) cameras.

## Appendix 9

## Proposed SCS technology solution – SCS system context



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## Appendix 10 Scope for safety cameras and the Camera Management System and for the Infringement Processing System

Table 2: Scope for safety cameras and safety camera management system

In scope	
a)	<p><b>Safety cameras</b> – procurement of up to an additional <sup>s 9(2)(g)</sup> safety cameras required to support the first phase of expansion of the safety camera network across the highest risk part of the road network through to the end of the current National Land Transport Plan in June 2024. The additional new cameras will be new generation advanced multi-purpose system safety cameras of the following types:</p> <ul style="list-style-type: none"> <li>– Halo single camera system for red-light or fixed speed enforcement (up to 3 lanes)</li> <li>– Halo dual camera system for red-light enforcement (up to 6 lanes)</li> <li>– s 9(2)(f)(iv)</li> <li>– s 9(2)(f)(iv)</li> <li>– Radar cam mobile speed, includes auxiliary camera and flash for front/rear plate capture</li> </ul>
b)	<p><b>Safety camera management system (CMS)</b> – a system that enables the management (including secure data transfer) and monitoring of the safety camera network as the current manual management processes employed by New Zealand Police are unsustainable with the planned expansion of the safety camera network. The system will include the following key capabilities:</p> <ul style="list-style-type: none"> <li>– Management of the safety camera network</li> <li>– Monitoring of the health of the safety camera network</li> <li>– s 9(2)(f)(iv)</li> <li>– Reporting on the safety camera network to meet agreed SLAs</li> </ul>
c)	<p>In alignment with the agreed date of operationalisation of transferred functions from New Zealand Police to Waka Kotahi, the ownership of existing New Zealand Police Operational Safety Cameras – approximately 100 safety cameras comprising the older generation NK7 model safety cameras of the following types:</p> <ul style="list-style-type: none"> <li>– Fixed/static speed</li> <li>– Red-light (speed dual purpose capability)</li> <li>– Mobile</li> </ul>
Out of scope	
a)	Procurement of a back-office infringements processing system which is the subject of a separate procurement plan that has been submitted for approval.
b)	Safety cameras calibration and certification services – these services may continue to be provided by New Zealand Police, or established within Waka Kotahi or out-sourced to a third party. However, this is subject to the definition of the future state operating model, organisation design and governance decisions an agreed service and cost model.
c)	Mobile camera enforcement services – these services will be transferred and established within Waka Kotahi including people (traffic camera operators) and mobile camera vehicles (including fitout). This is subject to the definition of the operating model, organisation design and governance decisions.
d)	Business Process Outsourcing (BPO) options that outsource the people and process components for the Safety Camera Management and Infringement Processing capabilities.



**Table 3: Scope for Infringement Processing System**

In-scope	
<p>The procurement scope includes technology systems and services to support a back-office infringements processing platform that provides capabilities in:</p> <ul style="list-style-type: none"> <li>• incident verification</li> <li>• adjudication</li> <li>• customer management</li> <li>• processing and issuance</li> <li>• court file preparation</li> <li>• self-service</li> <li>• case management and workflow</li> <li>• payments tracking</li> <li>• business rules configuration and implementation</li> <li>• reporting.</li> </ul>	
Out-of-scope	
<ul style="list-style-type: none"> <li>a) Procurement of safety cameras – additional safety cameras may be procured through novation or renegotiation of New Zealand Police’s existing supply contract for safety cameras.</li> <li>b) Procurement of a Safety Camera Management System – a technology system that provides management, monitoring, reporting and automatic download of event data (incidents and survey data) from the safety camera network. This is may be procured through novation or renegotiation of New Zealand Police’s existing supply contract for safety cameras.</li> <li>c) Safety cameras calibration and certification services – these services may be established within Waka Kotahi or out-sourced to a third party. However, this is subject to the definition of the future state operating model, organisation design and governance decisions an agreed service and cost model.</li> <li>d) Mobile camera enforcement services – these services will be transferred and established within Waka Kotahi including people (traffic camera operators) and mobile camera vehicles (including fitout). This is subject to the definition of the operating model, organisation design and governance decisions.</li> <li>e) Business Process Outsourcing options that outsource the people and process components for the safety camera management and infringement processing capabilities.</li> </ul>	



## Appendix 11 Supporting information for investment in the Safety Camera System Programme

This appendix contains is additional information about how the SCS Programme considers investment in the current proposal in terms of enabling technology, security considerations, privacy considerations, and future proofing.

### *Enabling technology*

Waka Kotahi will be guided by eight principles when acquiring fit-for-purpose technology platforms.

- Incorporate innovation that can support new ways of working that are efficient and maximise the potential of automation.
- Invest in cloud-based or 'as a service' technology solutions with a proven track record, wherever practicable.
- Be supplier-agnostic to enable integration and operation of different supplier camera technologies and downstream processing.
- Be able to scale to accommodate additional cameras, their capabilities, and the processing of increased volumes of incidents and interventions.
- Provide the flexibility to accommodate additional types of infringements that Waka Kotahi may consider issuing, in the future, as part of its regulatory and network management functions.
- Provide or enable innovative and responsive ways of communicating with customers in real-time or near real-time, to support driver behaviour change.
- Comply with NZ and Waka Kotahi security standards, including review and approval by the Technical Architecture Governance Group of Waka Kotahi.
- Comply with NZ privacy standards and requirements.

In terms of security, Waka Kotahi recognises that:

- technology-enabled system, applications, and services must be designed and supported with appropriate levels of resilience, redundancy, and security
- system may need to integrate with and may affect existing system in and between Waka Kotahi and New Zealand Police
- secure data sharing between the two organisations will be required on an ongoing basis.

In terms of privacy, Waka Kotahi recognises that:

- the data and digital images captured by cameras, their storage, and their use all have privacy implications
- new issues will arise with new technologies that can be used for other than current safety-related purposes (such as average speed and mobile phone use detection)
- it must engage with the Office of the Privacy Commissioner, undertake Privacy Impact Assessments, and implement recommendations.

### *Security considerations*

The programme includes the development or inclusion of technology-enabled system, applications and services that need to be designed and supported with the appropriate level of resilience, redundancy, and security. These systems will need to integrate with and may affect existing system in and between Waka Kotahi and New Zealand Police. (There will be a requirement to exchange data between the two organisations on an ongoing basis.)

All technology enabled will comply with NZ and Waka Kotahi security standards, including review and approval by the Technical Architecture Governance Group of Waka Kotahi.

## Privacy considerations

The data and digital images captured by the cameras, their storage and their use will have privacy implications that need to be considered and addressed. Although some of the issues related to speed management with the current cameras have been addressed, new technologies can be used for other safety-related purposes (such as average speed and mobile phone use detection) that operate in a different way.

The programme will engage with the Office of the Privacy Commissioner, undertake requisite Privacy Impact Assessments, and implement recommendations so privacy issues are properly addressed as part of programme delivery.

## Future proofing

ITS and infrastructure will be future proofed to enable Waka Kotahi to trial and adopt both proven and unproven technologies:

- **Mobile point-to-point cameras** – could be a game changer, enabling us to manage corridor speeds rather than spot speed. Indicatively, these cameras have potential to provide the lowest cost and network coverage when compared with traditional cameras. They also remove the ‘kangaroo effect’ of spot speed assets where drivers slow down abruptly before a camera and speed up again after passing the camera.
- **Smart cameras** – include a sophisticated camera and software that can perform processing at the roadside. In the past, a typical camera was only able to capture images. Now, with the smart camera concept, a camera will have the ability to generate specific information from the images it has captured. The built-in intelligent image processing and pattern recognition algorithms allow these cameras to detect motion, measure objects, read vehicle number plates, and recognise human behaviours. Smart cameras deployed at intersections can analyse the entire trajectory of vehicles and only create incidents for verification that are genuine offences, unlike the many false positives that are generated from the current fleet of red-light safety cameras.
- **CCTV and video analytics** – unlike smart cameras that have sophisticated software to identify specific offences at the roadside, Auckland Transport opted for CCTV cameras that live-stream video to a video-analytics platform to perform a variety of network management and road safety functions, such as detecting traffic violations and identifying congestion issues and parking problems. Auckland Transport also uses video analytics to remotely enforce traffic rules on special vehicle lanes.
- **Mobile trailers** – unstaffed mobile trailers are used across Australia and several European jurisdictions as another tool to address road safety risks. These could be particularly useful as average speed cameras to lower median speeds at roadworks, for example. At the request of Waka Kotahi, the New Zealand Police is already building trailer prototypes for testing. Therefore, potential exists to incorporate trailers relatively quickly depending on testing evaluation.
- **Intelligent speed adaptation** – is an in-vehicle system that uses information on the vehicle’s position in a network in relation to the speed limit in force at that location. This can support drivers to comply with the speed limit everywhere in the network.
- **Event data recorders (Eroads)** – use GPS vehicle tracking to monitor the vehicle’s speed across its entire route and can be used to understand whether the vehicle was speeding. Eroads can also provide immediate feedback to drivers if they are travelling over the posted speed limit.
- **Electronic vehicle identification** – uses infrastructure to vehicle technology that can uniquely identify a vehicle based on an electronic tag rather than a safety camera having to view the vehicle and licence plate. It is not capable of detecting other unsafe road uses such as distracted driving or not wearing a seat belt. An example is radio frequency identification (RFID).
- **Distracted driving and non-use of restraints identification** – a sensor system records the speed of vehicles and a specialised camera captures a high-resolution image of the vehicle, driver, and registration plate. The image can be used to provide evidence, for example, that a driver is using

a mobile phone or not wearing a seatbelt. Camera-based enforcement can be invasive, as images are purposely taken of the driver and passenger compartment. Privacy issues could include how images are stored, accessed (and by whom), and disposed of.

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## Appendix 12 Long-list options identification

### *Stakeholders agreed the critical success factors against which options would be assessed*

An optioneering workshop on 3 November 2021 with stakeholders determined appropriate critical success factors (CSFs) against which each option would be evaluated using multi-criteria analysis (MCA). This analysis assisted stakeholders to move from a long-list of potential options to a short-list.

Table 4 reiterates out the investment objectives from the strategic case, and Table 5 sets out the CSFs stakeholders agreed would be used to evaluate long-listed options to determine a short-list of options for further examination.

**Table 4: Investment objectives used in optioneering process**

#	Investment objective
1	To reduce average speed on roads that are treated with safety cameras (where safety cameras are deployed) leading to a reduction in DSIs by 2030 (from 2018 baseline).
2	To improve the quality of SCS (effectiveness) service to the public by reducing DSIs due to compliance with speed limits by 2030 (from 2018 baseline).
3	To improve road user compliance with speed limits through the SCS that reduce risk of harm for all road users by 2030 (from 2018 baseline).
4	To improve public attitudes towards safety cameras as part of a Safe System, measured as an increase in social licence for safety cameras by 2030 (from 2018 baseline).
5	To maximise the return on investment in the SCS for the public by reducing DSI cost to the country by 2030.

**Table 5: Critical success factors used in the SCS optioneering process**

#	Description	How well does the option ...
CSF 1	Strategic fit and business needs	<p>Meet the agreed investment objectives</p> <p>Meet related business needs (opportunities and problems associated with the current situation)</p> <p>Meet service requirements, for example, minimum current service levels of the SCS</p> <p>Fit with:</p> <ul style="list-style-type: none"> <li>the RtZ strategy (reduce DSIs by 40% by 2030)</li> <li>Waka Kotahi strategy (aligned with Safe System outcomes – a New Zealand where no one is killed or seriously injured when using or working on the transport system)</li> <li>Ministry of Transport healthy and safe people outcomes (to protect people from transport-related injuries and harmful pollution and makes physically active travel an attractive option)</li> </ul>
CSF 2	Potential achievability	<p>Meet technical achievability – rate the technical or practical ease/difficulties that may be present, when implementing this alternative/option for example local site geography or existing contract</p> <p>Meet safety and design – rate the level of potential hazards associated with the alternative/option that pose a health and safety risk in design, operation, or maintenance</p> <p>Meet consentability – the level of consenting complexity/difficulty and risks of this adversely impacting on required workstream timelines or other aspects</p>
CSF 3	Potential affordability	Meet capital, operational, and maintenance costs – is the indicative cost of the option affordable

#	Description	How well does the option ...
CSF 4	Supplier capacity and capability	Meet supplier capacity and capability – does the supplier have capacity and capability to deliver the required option
CSF 5	Programme timeline	Meet programme timeline – can the option be delivered
CSF 6	Opportunities and impacts	Consider environmental effects – any specific environmental impact created Consider social and culture impacts – social licence for having safety cameras across the network and to turn on new technology (beyond cameras) Consider climate change mitigation – impact of the option on demand for travel by car, now or in the future Consider climate change adaptation – does option create any other climate change risk Consider cumulative impacts
CSF 7	Impacts on Te Ao Māori	Impact on Te Ao Māori
CSF 8	Fatal flaws	Fatal flaws – does the option present any fatal flaws (yes/no)
CSF 9	Potential value for money	Option optimises public value (social, economic, and environmental) in terms of potential costs, benefits, and risks

### **Stakeholders generated 123 options of which 32 were evaluated using MCA**

The long-list process focuses on developing the breadth and depth of possible interventions, SCS components, and options. Option ideas were generated at workshop 1 on 18 November 2021. Attendees at this workshop included representatives from the SCS Programme, RtZ programme partners, the Waka Kotahi Investment team, internal Waka Kotahi IQA advisors, and Police (see the full list of stakeholders in Appendix 14).

Participants at the workshop were asked to generate ideas that would resolve the functional needs related to the identified problems and benefits sought. In total, 123 long-list options were identified across five dimensions of MCA (defined in Table 6).

Stakeholders identified a comprehensive range of feasible programme options under each of the five dimensions of choice.

**Table 6: Options considered within the five dimensions of MCA**

Dimension of choice	Description
1 Scope	The 'what' in terms of coverage of the programme.
2 Service solution	The 'how' in terms of delivering the 'preferred' scope of the programme.
3 Service delivery	The 'who' in terms of delivering the 'preferred' scope and service solution for the programme.
4 Service implementation	The 'when' in terms of delivering the 'preferred' scope, solution, and service delivery arrangements for the programme.
5 Funding	The 'funding' required for delivering the 'preferred' scope, solution, service delivery arrangements, and implementation path for the programme.



## Long-list options assessment

*Stakeholders performed an exhaustive evaluation of each option using MCA*

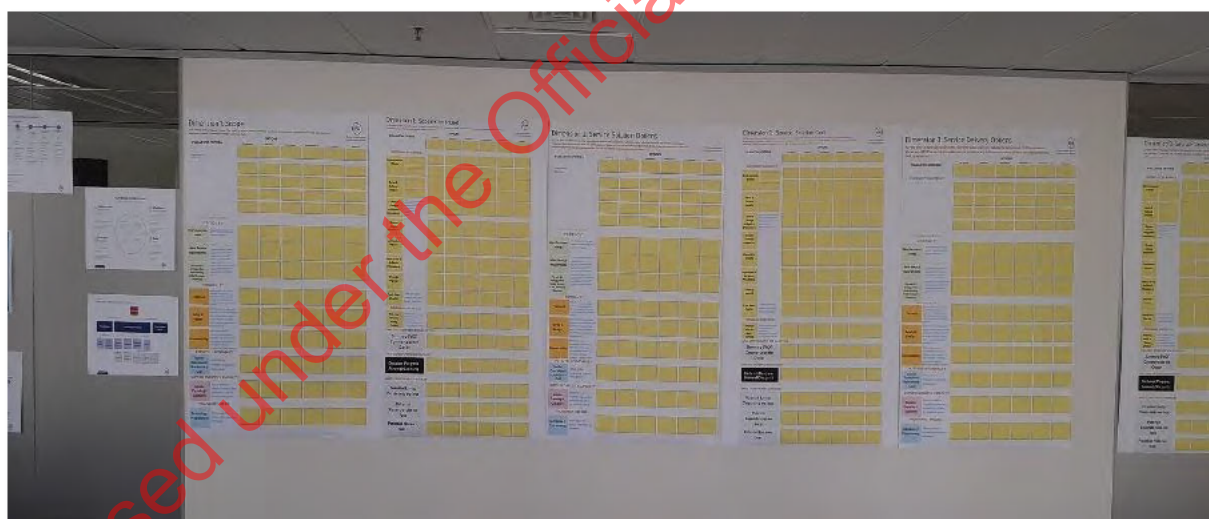
Stakeholders filtered the initial 123 options at a workshop to exclude options that were:

- considered outside the scope of the IBC (for example, outside the programme area)
- required significant legislative changes and could not be achieved in the current programme cycle
- part of another programme in the RtZ portfolio of initiatives
- business as usual or would otherwise be implemented (for example, the use of staging)
- politically sensitive and had been agreed at the programme's outset to be 'out of bounds' (for example, outsourcing all SCS functions)
- at a level of detail beyond what is appropriate for this stage of the business case process
- considered infeasible due to significant physical constraints (for example, average speed cameras being deployed everywhere)
- duplicates of other options (some duplicates were merged to create the final option to be assessed).

An initial appraisal of the long-list filtered out 91 options that were less likely to offer value for money and to make the short-list for further economic appraisal.

Following the initial filtering exercise, stakeholders took the remaining 32 options and evaluated each option against investment objectives and CSFs across the five dimensions (a picture of the long-listed options from the workshop is in Figure 4).

**Figure 4: Long-list MCA options workshop wall, 18 November 2021**



Stakeholders scored each long-listed option using the Waka Kotahi MCA seven-point scoring system (see Table 7). The facilitator moderated scores to arrive at a moderated final score for each option.



**Table 7: Waka Kotahi MCA scoring system**

Magnitude	Definition	Score
Large positive (+ve)	Major positive impacts resulting in substantial and long-term improvements or enhancements of the existing environment.	3
Moderate positive (+ve)	Moderate positive impact, possibly of short-, medium-, or long-term duration. Positive outcome may be in terms of new opportunities and outcomes of enhancement or improvement.	2
Slight positive (+ve)	Minimal positive impact, possibly lasting over only the short term. May be confined to a limited area.	1
Neutral	Neutral – no discernible or predicted positive or negative impact	0
Slight negative (-ve)	Minimal negative impact, possibly lasting over only the short term and definitely able to be managed or mitigated. Might be confined to a small area.	-1
Moderate negative (-ve)	Moderate negative impact. Impacts may be short, medium or long term and are highly likely to respond to management actions.	-2
Large negative (-ve)	Impacts with serious, long-term, and possibly irreversible effect leading to serious damage, degradation, or deterioration of the physical, economic, cultural, or social environment. Requires major rescope of concept, design, location, and justification or extensive work to mitigate the effect.	-3

At the end of the MCA process all scores were aggregated. The result for each option leads to one of three final choices.

- The option is **discounted** from further appraisal.
- The option is **carried forward** for further consideration.
- The option is identified as a **likely way forward**.

The options carried forward to the short-list evaluation are illustrated in Figure 5 and indicative output after the MCA is illustrated in Figure 6 with a detailed description of the long-listed options and moderated scores applied in the MCA process in Appendix 15. The final long-listed options across the MCA dimensions are described in Table 8.

Figure 5: Final summary of options carried forward to short-list evaluation

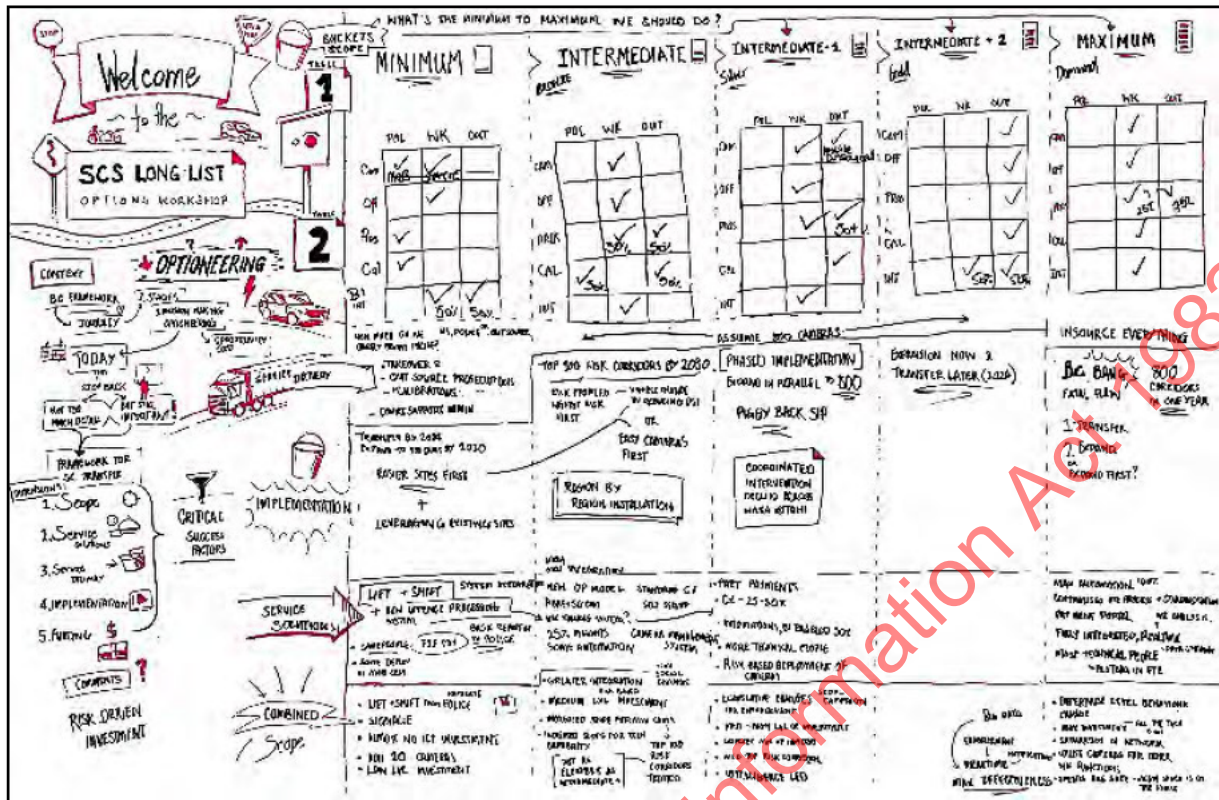


Figure 6: Indicative long-list output after MCA (see Appendix 14 for detail)

Option ID	Option Name	Option Type	Option Category	Option Sub-category	Option Description	Option Status	Option Priority	Option Risk	Option Impact	Option Benefit	Option Cost	Option Value	Option Score	Option Rating	Option Recommendation	Option Action	Option Date	Option User	Option Version	Option Comment
1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1	Option 1
2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2	Option 2
3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3	Option 3
4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4	Option 4
5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5	Option 5
6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6	Option 6
7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7	Option 7
8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8	Option 8
9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9	Option 9
10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10	Option 10
11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11	Option 11
12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12	Option 12
13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13	Option 13
14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14	Option 14
15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15	Option 15
16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16	Option 16
17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17	Option 17
18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18	Option 18
19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19	Option 19
20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20	Option 20
21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21	Option 21
22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22	Option 22
23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23	Option 23
24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24	Option 24
25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25	Option 25
26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26	Option 26
27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27	Option 27
28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28	Option 28
29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29	Option 29
30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30	Option 30

Table 8: Moving from long-list to short-list based on MCA across the five dimensions of choice

Dimension	Do Nothing	Do Minimum	Intermediate (bronze)	Intermediate + 1 (silver)	Intermediate + 2 (gold)	Maximum (diamond)
1. Scope	1.1 – Keep operations at Police and Waka Kotahi continues to fund as is. Note: Has fatal flaw, as government has requested Waka Kotahi to take over the function	1.2 – Lift & shift Police functions as is with no camera expansion	1.3 – Risk-based treatment of high-risk corridors, implement cameras across high-risk corridors	1.4 – Treat high- to medium-risk corridors up to cameras by FY30  Note: May include legislative change, business intelligence enabled, and camera mixes	1.5 – Treat high- to low-risk corridors with up to cameras by FY30  Note: May include legislative change, business intelligence enabled, and camera mixes	1.6 – Treat all corridors across NZ with safety cameras; maximum investment, saturation of network with cameras with all technology turned on & business intelligence driven in real-time
	Carried forward	Carried forward	Likely way forward	Likely way forward	Likely way forward	Carried forward
2. Service solution		2.2 – Includes: <ul style="list-style-type: none"> <li>lift &amp; shift</li> <li>new offence processing system</li> <li>same people (FTE count same)</li> <li>same deployment and mobile capability</li> <li>same system integration</li> <li>face-to-face payment</li> <li>basic reporting with Police operating model</li> <li>new offence processing system (IPS)</li> <li>new camera management system (CMS)</li> <li>fibre + 5G cameras</li> <li>no increase in people</li> <li>same mix of cameras</li> <li>same system integration with Ministry of Justice as currently form Police</li> <li>face-to-face payment, and self-service payments</li> <li>no customer experiences</li> <li>no changes in business processes</li> </ul>	2.3 – Includes: <ul style="list-style-type: none"> <li>new operating model</li> <li>new IPS</li> <li>new CMS</li> <li>fibre + 5G cameras</li> <li>no increase in people</li> <li>same mix of cameras</li> <li>same system integration with Ministry of Justice as currently form Police</li> <li>face-to-face payment, and self-service payments</li> <li>no customer experiences</li> <li>no changes in business processes and automation</li> </ul>	2.4 – Includes: <ul style="list-style-type: none"> <li>new operating model</li> <li>new IPS</li> <li>new CMS</li> <li>risk-based deployment of cameras</li> <li>fibre + 5G cameras</li> <li>increase in people (FTEs) by up to 40% max (but more technical people)</li> <li>different mix of cameras and mobile capability</li> <li>system integration with Ministry of Justice</li> <li>face-to-face payment, and self-service payments</li> <li>standard customer experience (uplift of 25% min)</li> <li>business intelligence enabled and automation (30% max)</li> <li>part-payments or alternative resolutions</li> </ul>	2.5 Includes: <ul style="list-style-type: none"> <li>new operating model</li> <li>new IPS</li> <li>new CMS</li> <li>greater social licence to turn on more of the capabilities of cameras and technology platforms to catch more than speed offences on the road</li> <li>straight-through processing utilised to greater degree and confidence in business operations</li> <li>risk-based deployment of cameras</li> <li>fibre + 5G cameras</li> <li>FTEs predominately technical people, with manual processing reduced to bare minimum</li> <li>greater mix of high-risk cameras that deliver greatest return on investment (eg, average speed)</li> <li>seamless integration with Ministry of Justice</li> <li>face-to-face payment, and self-service payments</li> </ul>	2.6 Includes: <ul style="list-style-type: none"> <li>new operating model</li> <li>new IPS</li> <li>new CMS</li> <li>fully integrated real-time: risk analysis and data sharing (100%)</li> <li>fibre + 5G cameras</li> <li>mostly technical FTEs (for example, data scientists)</li> <li>different mix of cameras and mobile capability</li> <li>full integration with main government departments and Crown agencies</li> <li>omni-channel payment suite</li> <li>high level of customer experience (100%)</li> <li>centralised business intelligence process &amp; standardisation (100%)</li> </ul>

Dimension	Do Nothing	Do Minimum	Intermediate (bronze)	Intermediate + 1 (silver)	Intermediate + 2 (gold)	Maximum (diamond)
					<ul style="list-style-type: none"> <li>high level of customer experience (uplift of 25%min)</li> <li>business intelligence led and greater automation of tasks (50% max)</li> <li>part-payments or alternative resolutions (support by AI &amp; good governance)</li> </ul>	
	Carried forward	Carried forward	Likely way forward	Likely way forward	Likely way forward	Discount
3. Service delivery		3.2 Functions provided as follows: 1 Police in charge of: <ul style="list-style-type: none"> <li>mobile cameras</li> <li>prosecutions</li> <li>calibrations</li> </ul> 2 Waka Kotahi in charge of: <ul style="list-style-type: none"> <li>static cameras</li> <li>business intelligence 50%</li> </ul> 3 Outsource or partner: <ul style="list-style-type: none"> <li>business intelligence 50%</li> </ul> Note: Level of outsourcing/partnership to be developed further as not fully developed	3.3 Functions provided as follows: 1 Police in charge of: <ul style="list-style-type: none"> <li>calibrations retain 50% and Waka Kotahi partners 50% (if possible)</li> <li>cameras all</li> <li>offence processing</li> <li>prosecution 50% (and Waka Kotahi partners 50% if possible)</li> <li>business intelligence</li> </ul> 2 Outsource or partner: <ul style="list-style-type: none"> <li>prosecution 50% (partner if possible)</li> <li>calibration 50% (partner if possible)</li> </ul> Note: Level of partnership to be developed further as not fully developed currently	3.4 Functions provided as follows: 1 Waka Kotahi: <ul style="list-style-type: none"> <li>cameras all</li> <li>offence processing</li> <li>prosecution 50% (and Waka Kotahi partners 50%, if possible)</li> <li>business intelligence</li> </ul> 2 Outsource or partner: <ul style="list-style-type: none"> <li>prosecution 50% (partner if possible)</li> <li>calibration 100% (partner if possible)</li> </ul> Note: Level of partnership to be developed further as not fully developed	3.5 Functions provided as follows: 1 Waka Kotahi: business intelligence – 50% 2 Partner: <ul style="list-style-type: none"> <li>cameras 100% (note: fatal flaw, can't do, as must retain core functions)</li> <li>offence processing – 100% (note: fatal flaw, can't do, must retain core functions)</li> <li>prosecution – 100%</li> <li>calibration – 100% (see limits &amp; constraints below)</li> <li>business intelligence – 50%</li> </ul> Note: Level of partnership to be developed further as not fully developed. Note: Contains fatal flaw – can't move forward as can't outsource cameras.	3.6 Functions provided as follows: 1 Waka Kotahi: <ul style="list-style-type: none"> <li>cameras 100%</li> <li>offence processing 100%</li> <li>prosecution 25% (and outsource 75%)</li> <li>calibration 100%</li> <li>business intelligence 100%</li> </ul> 2 Outsource or partner: <ul style="list-style-type: none"> <li>prosecution 75%</li> </ul> Note: Level of outsourcing/partnership to be developed further as not fully developed
	Carried forward	Likely way forward	Carried forward	Likely way forward	Discount	Discount

Dimension	Do Nothing	Do Minimum	Intermediate (bronze)	Intermediate + 1 (silver)	Intermediate + 2 (gold)	Maximum (diamond)
4. Service implementation		4.2 No camera expansion but a slow transfer of cameras to Waka Kotahi	4.3 Phased implementation (about 40 cameras per year, reaching s 9(2)(g)(iii) by FY30)	4.4 Phased implementation s 9(2)(g) new cameras per year <ul style="list-style-type: none"> <li>takeover Police functions by 2024</li> <li>expand cameras in parallel s 9(2)(g)(ii) by 2030</li> <li>piggyback off other Road to Zero (RtZ) programmes (eg, Speed and Infrastructure Programme SIP)</li> <li>perform coordinated intervention across Waka Kotahi (look at all programmes and what they are trying to do for that site treatment based on risk before installing cameras)</li> </ul>	4.5 Phased implementation s 9(2)(g) new cameras per year <ul style="list-style-type: none"> <li>takeover Police functions by 2024</li> <li>expand cameras in parallel to 1,500 by 2030</li> <li>piggyback off other RtZ programmes (eg, SIP)</li> <li>Perform coordinated intervention across Waka Kotahi (look at all programmes and what they are trying to do for that site treatment based on risk before installing cameras)</li> </ul>	4.6 Big bang expansion of s 9(2)(g) cameras in one year <ul style="list-style-type: none"> <li>transfer in the same year as expansion</li> <li>expand at the same time in same year</li> </ul> Note: Fatal flaw
	Carried forward	Likely way forward	Carried forward	Likely way forward	Carried forward	Discount
5. Funding	5.1 Fund Police as is	5.2 s 9(2)(f)(iv)	5.3 NLTF funded, CAPEX funded through RtZ and OPEX through Investment Management	5.4 NLTF funded, CAPEX and OPEX through RtZ	5.5 Treasury funds all	5.6 Alternative procurement model – public-private partnership
	Carried forward	Carried forward	Likely way forward	Likely way forward	Discount	Discount



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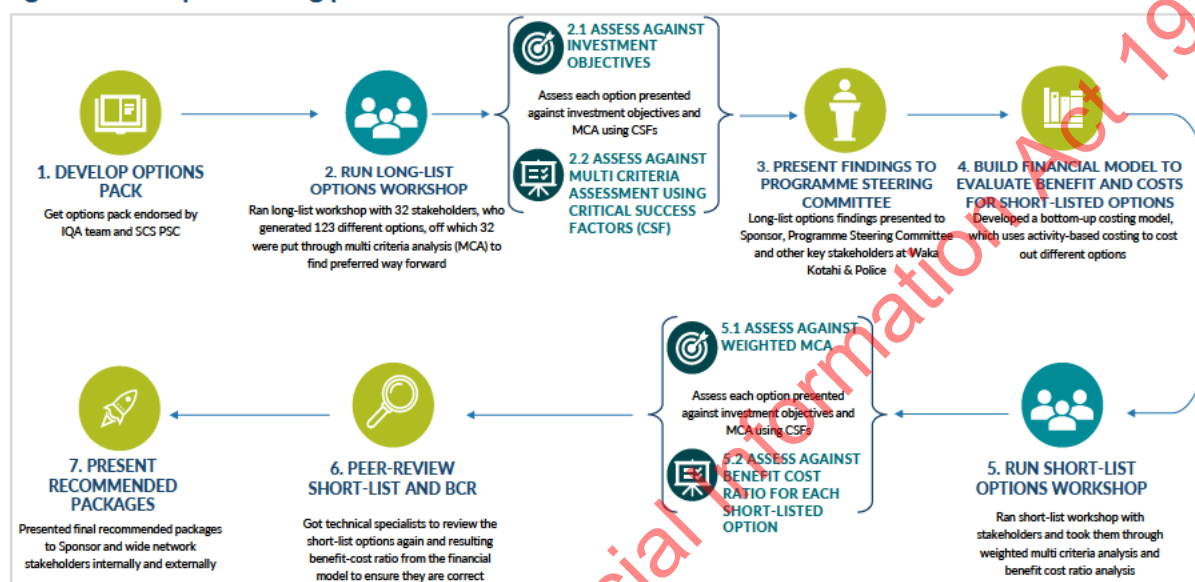
## Appendix 13 Optioneering process to determine preferred option

### Waka Kotahi optioneering process used to determine the preferred option

The Waka Kotahi optioneering process was applied to establish the preferred option. Optioneering is the in-depth consideration of alternatives to find a preferred option, in this case for the SCS.

Figure 7 illustrates the SCS optioneering process conducted with senior stakeholders between 25 October and 2 December 2021. The Programme Steering Committee endorsed this approach in October 2021.

Figure 7: SCS optioneering process



Notes: BCR = benefit-cost ratio; CSF = critical success factor; 'IQA team' means the internal Waka Kotahi team that performs quality assurance.

### Do minimum – baseline comparator option

Stakeholders agreed during the optioneering workshops that the do minimum option represents the minimum level of expenditure required to maintain a minimum level of SCS service – not the minimum level of investment required to achieve programme objectives.

Table 9 outlines the agreed do minimum for the SCS Programme. This option is used as the baseline comparator for the subsequent value for money assessment.

Table 9: Do minimum option for the SCS Programme

Do minimum option	Rationale
1 Transfer safety camera systems from Police to Waka Kotahi	Transfer of ownership was mandated by the Minister of Transport and agreed by Cabinet in 2019. <sup>1</sup>
2 Hold the number of safety cameras as is in the network with no new investment for camera expansion	No new investment is made to expand the SCS network across the country, only to maintain the current service level.
3 Develop a new operating model for the Safety Camera System (SCS) at Waka Kotahi (that is, people, processes, and technology)	A new operating model is required as Waka Kotahi doesn't have SCS functions in-house s 9(2)(g)(i), processes, and technology into its existing operations.

Do minimum option	Rationale
<b>4</b> Get a new camera management system (CMS) and a new infringement processing system (IOPS)	A new CMS and a new IPS are required for Waka Kotahi to manage and process images captured by the Police camera network, as the current police system is at end of life and cannot be decoupled from Police and transferred to Waka Kotahi (as noted in the due diligence process for the transfer). <sup>2</sup>

#### Notes

- 1 Cabinet. 2019. *Minute of Decision – Tackling Unsafe Speeds Programme (CAB-19-MIN-0575)*; Associate Minister of Transport. 2019. *Tackling Unsafe Speeds Programme* (Cabinet paper). Wellington: Author.
- 2 PwC. 2021. Due diligence for Police transfer of safety cameras to Waka Kotahi. Unpublished confidential document

### **Shortlisted options – five options shortlisted**

This section describes the short-list and sets out the reason for selecting the recommended options and the rationale for discarding other options.

The short-list packaged together individual components across the five dimensions of the MCA to create final short-list packages for assessment. For a complete description of moving forward from long-list to short-list packages, see Appendix H.

Stakeholders analysed the long-list using multi-criteria analysis (MCA) to establish the short-list of options for further assessment (see Appendix H).











The shortlist comprises:
















- **Option 1: Do Nothing** – Leave the SCS with Police and continue to fund as is.
- **Option 2: Do Minimum** (baseline comparator for determining value for money) – Transfer the SCS from Police to Waka Kotahi with a new operating model at Waka Kotahi, a new camera management system (CMS) and infringement processing system (IPS) with no new camera expansion.
- **Option 3: Less Ambitious Way Forward (bronze option)** – Transfer the SCS from Police to Waka Kotahi with a new operating model at Waka Kotahi, new CMS and IPS, and expand the SCS across high-risk corridors only s 9(2)(g)(ii) new cameras by FY2030).
- **Option 4: Preferred Way Forward (silver option)** – Transfer the SCS from Police to Waka Kotahi, with a new operating model at Waka Kotahi, new CMS and IPS, and expand the SCS across high-to-medium risk corridors s 9(2)(g)(ii) new cameras by FY2030).
- **Option 5: More Ambitious Way Forward (gold option)** – Transfer the SCS from Police to Waka Kotahi with a new operating model at Waka Kotahi, new CMS and IPS, and expand the SCS across high-risk corridors s 9(2)(g)(ii) new cameras by FY2030).

### **Weighted MCA was applied to evaluate the short-list and determine the preferred option**











A short-list options workshop was held on 2 December 2021 with stakeholders. They assessed and evaluated the five options using weighted MCA (WMCA), which is summarised in Table 10 and detailed in Appendix 15.

Table 10: Summary of short-list options evaluation using weighted multi-criteria analysis (WMCA)

	Do Nothing	Baseline	Bronze option	Silver option	Gold option
	Option 1: Do nothing – Leave the SCS with Police and continue to fund as is	Option 2: Do Minimum – Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS	Option 3: Less Ambitious Way Forward – Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS, new cameras on high-risk corridors <b>s 9(2)(g)(ii)</b> by FY30)	Option 4: Preferred Way Forward – Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS, and new camera on high- to medium-risk corridors <b>s 9(2)(g)(ii)</b> by FY30)	Option 5: More Ambitious Way Forward – Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS, new cameras on high- to low-risk corridors <b>s 9(2)(g)(ii)</b> by FY30)
Investment objectives (30 points)	 Scored <b>0 points</b> in WMCA. Doesn't achieve any of the investment objectives	 Scored <b>6 points</b> in WMCA. Achieves very few components of investment objectives. Current police cameras are not necessarily located in the highest risk parts of the network. This means this option doesn't support a reduction in death and serious injuries (DSIs) on highest risk parts of the corridor and help achieve the Road to Zero (RtZ) target.	 Scored <b>19 points</b> in WMCA. Supports the investment objectives and has high probability for treating all high-risk corridors by 2030. Most of the DSIs occur around high-risk corridors, by treating that area it will discourage excessive speeds in these areas, which will reduce the risk of DSIs occurring. It is also likely to generate positive social licence from the public.	 Scored <b>26 points</b> in WMCA. Contributes directly towards reducing DSIs & assists RtZ meet its 40% DSI objectives by 2030. This option has appropriate level of investment & scale to create halo effect across the network to reduce DSIs. Creates indirect benefit on public attitudes – by reducing DSIs significantly, the public in turn views the intervention as positive.	 Scored <b>30 points</b> in WMCA. Completely achieves the investment objective of reducing DSIs by 40% across the entire network. Has the highest level of investment and scale across the network to reduce DSIs. Creates an eroding effect on social licence with public by saturating the network with cameras that is, going from <b>s 9(2)(g)(ii)</b> across the country in less than 10 years.
Strategic fit and business needs – Tacking Unsafe Speeds (TUS) Cabinet directive, RtZ strategy, Waka Kotahi Safe System outcome and Ministry of Transport (MoT) healthy & safe people outcomes (12 points)	 Scored <b>0 points</b> in WMCA. Doesn't achieve strategic fit and meets business needs.	 Scored <b>4 points</b> in WMCA. Investment in only new operating model and new CMS & IPS to make cameras work at Waka Kotahi doesn't help achieve the business need to meet Cabinet directive to reduce DSIs and align with RtZ strategy or meet Waka Kotahi Safe System outcome.	 Scored <b>7 points</b> in WMCA. Investment in new cameras on high-risk corridors goes some way to meeting business need (Cabinet directive). This option aligns with RtZ strategy but doesn't fully meet the objective of 4% DSI reduction by 2030. It supports Waka Kotahi Safe System outcome and MoT outcomes.	 Scored <b>10 points</b> in WMCA. Investment in new cameras across high- to medium-risk corridor meets Waka Kotahi business need set by TUS Cabinet paper directive. It meets the RtZ 4% DSI reduction by 2030 as well as the Waka Kotahi Safe System outcome and MoT outcomes.	 Scored <b>10 points</b> in WMCA. Investment in new cameras across high- to low-risk corridor meets Waka Kotahi business need set by TUS Cabinet directive. It meets the RtZ 4% DSI reduction by 2030 as well as the Waka Kotahi Safe System outcome and MoT outcomes.

	Do Nothing	Baseline	Bronze option	Silver option	Gold option
<b>Potential achievability – people, process, tech, safety, design and consenting</b> (12 points)	 Scored <b>12 points</b> in WMCA. Waka Kotahi has to do nothing but fund Police as is, this option is completely achievable.	 Scored <b>12 points</b> in WMCA. Waka Kotahi has to do minimum and requires no new cameras to be expanded across the network.	 Scored <b>9 points</b> in WMCA. Waka Kotahi only needs to install cameras on high-risk corridors that requires less consenting and achievable by FY30.	 Scored <b>8 points</b> in WMCA. Waka Kotahi needs to install cameras on high- to medium-risk corridors, which requires a lot of consenting, safety, and design to be incorporated for s 9(2)(g)(ii) new cameras by FY30.	 Scored <b>7 points</b> in WMCA. Waka Kotahi needs to install cameras on high- to low-risk corridors, which requires a lot of consenting, lots of safety and design to be incorporated for s 9(2)(g)(ii) new cameras by FY30.
<b>Supplier capacity &amp; capability</b> (12 points)	 Scored <b>12 points</b> in WMCA. Waka Kotahi has to do nothing but just fund.	 Scored <b>12 points</b> in WMCA. Waka Kotahi has to do minimum, which is novate the contracts from Police to Waka Kotahi.	 Scored <b>12 points</b> in WMCA. There is one supplier in the market and it has the capacity under the leasing model to provide cameras to be installed across high-risk corridors s 9(2)(g)(ii) by FY30.	 Scored <b>8 points</b> in WMCA. There is one supplier in the market and it has the capability, but the capacity is likely to be impacted when installing cameras on high- to medium-risk corridors s 9(2)(g)(ii) new cameras).	 Scored <b>5 points</b> in WMCA. With only one supplier in the market, its capacity to provide cameras for all high- to low-risk corridors will be challenging by FY30.
<b>Programme timeline – deliver by FY30</b> (16 points)	 Scored <b>16 points</b> in WMCA. Waka Kotahi has to do nothing but fund only.	 Scored <b>16 points</b> in WMCA. Waka Kotahi has to do just novate the contracts.	 Scored <b>16 points</b> in WMCA. Waka Kotahi has to install cameras on high-risk corridors s 9(2)(g)(ii) new cameras) by FY30.	 Scored <b>10 points</b> in WMCA. Waka Kotahi has to install cameras on high to medium risk corridors s 9(2)(g)(ii) new cameras) by FY30, which are a lot of new cameras per year.	 Scored <b>3 points</b> in WMCA. Waka Kotahi has to install cameras on high to low-risk corridors s 9(2)(g)(ii) new cameras) by FY30, which is almost not achievable given current labour market.



	Do Nothing	Baseline	Bronze option	Silver option	Gold option
<b>Social, cultural &amp; property impact</b> – social licence to do more with SCS and Te Ao Māori impact from SCS (12 points)	 Scored <b>0 points</b> in WMCA. Doesn't impact on social licence or Te Ao Māori.	 Scored <b>0 points</b> in WMCA. Doesn't impact on social licence or Te Ao Māori.	 Scored <b>2 points</b> in WMCA. Has a positive impact on social licence by making public aware of DSI reduction on high-risk roads and that cameras are not for revenue generation but for safety and deterring unsafe speeds. Has a neutral impact on Te Ao Māori.	 Scored <b>7 points</b> in WMCA. Has a positive impact on social licence by making public aware of reduction in DSIs on high to medium risk roads. Investment is made to raise awareness through public campaigns. Has a neutral impact on Te Ao Māori.	 Scored <b>3 points</b> in WMCA. Has a slightly negative impact on social licence by having cameras everywhere in a short time. Public may react adversely. Could have a negative impact on Te Ao Māori.
<b>Potential Value For Money</b> – public value for money (12 points)	 Scored <b>3 points</b> in WMCA. Cameras under Police create the same public value for money as is.	 Scored <b>3 points</b> in WMCA. Cameras novated to Waka Kotahi under new technology continue to deliver same value for money as is.	 Scored <b>10 points</b> in WMCA. Investment in cameras in high-risk roads create DSI savings from high-risk areas and deliver great public saving for investment made.	 Scored <b>13 points</b> in WMCA. Investment in cameras in high-to medium-risk roads create greatest DSI savings, which include halo effect across the network for reducing speed overall.	 Scored <b>3 points</b> in WMCA. Cameras on high- to low-risk roads some of the benefits gained earlier as the cost of implementing this solution outweigh the benefits created by DSI savings.
Fatal flaw (yes/no)	Yes <i>Doesn't meet TUS Cabinet directive</i>	No	No	No	No
Total WMCA score	44	54	76	84	63
Option rank	5	4	2	1	3

## Appendix 14 Stakeholders invited to the optioneering process

Role	Long-list workshop, 18 November 2021	Short-list packages workshop, 24 November 2021
Director of Land Transport	Y	
Programme Director, SCS Programme	Y	Y
Programme Manager, Strategy & Performance, SCS Programme	Y	Y
Project Manager, Design and Implementation SCS Programme	Y	Y
Strategic Technology Portfolio Lead	Y	Y
Senior Manager Road Safety	Y	
Team Lead Safe System Support	Y	
Project Manager Technology, SCS Programme	Y	Y
Project Manager, Change SCS Programme	Y	Y
Road Safety subject-matter expert	Y	
IQA Transport Services	Y	Y
Investment Advisor	Y	Y
New Zealand Police	Y	
New Zealand Police	Y	
Senior Manager Investment Assurance	Y	
New Zealand Police	Y	
Benefit Lead, SCS Programme	Y	
Camera subject-matter expert, SCS Programme	Y	Y
SBA Technology, SCS Programme	Y	Y
Investment Advisor IQA	Y	
Programme Development Manager, Speed and Infrastructure Programme	Y	
Programme Manager Speed Management Programme	Y	
Solution Architect	Y	
SBA Design & Implementation, SCS Programme	Y	Y
Enterprise Change Programme Manager	Y	
Senior Project Manager, Technology, SCS Programme	Y	
Senior Project Manager, Technology, SCS Programme	Y	
SBA, Technology, SCS Programme	Y	
SBA, Technology, SCS Programme	Y	

## Appendix 15     Weighted multi-criteria analysis process for the SCS solution short-listed options

The weighted multi-criteria analysis (WMCA) process for short-list evaluation was conducted on 2 December 2021.

WMCA took stakeholders through a five-step process.

- Step 1: Agree the list of critical success factors (CSFs) factors (similar to the long-list).
- Step 2: Rank each CSF from 1 to 10, giving a 1 to the criterion that is most important to the programme and a 10 to the least important.
- Step 3: Assign each CSF category a group weight by allocating 110 points among the seven categories. The more important the criterion, the higher its weight.
- Step 4: Assign each CSF (sub-criterion) its own weight – weights can be taken on any value, agreed by stakeholders between zero and the maximum of weight given to that group. For example, if stakeholders assigned a group weight of 30 to the investment objective group, the sub-criteria in that group can range from 0 to 30.
- Step 5: Moderate and assign scores to each option from 1 to 5 with 1 being low and 5 being high.

Appendix 16 Scoring of the long-list of options

Table 11: Long-list of options generated by stakeholders, 18 November 2021, with moderated scores observed (using Waka Kotahi 7-point scoring system)

Alternative or opt on details				Investment objectives					Or Road Success Factors				Potential affordable life	Supplier Capacity & Capability	Programme Timeline	Opportunity Use & Impacts										Programme specific official success factors		Limits/Constraints for each option			Summary of decision made				
Unique Identifier	Choice Dimension	Name of alternative/option	Detailed Description	Brief Description	1. To reduce average speed on roads that are treated with safety cameras, leading to a reduction in DfIs by 2030 (from 2018 baseline)	2. To improve the quality of Safety Camera Systems effectiveness service to the public by reducing DfIs due to compliance with speed limits by 2030 (from 2018 baseline)	3. To improve road user compliance to speed limits through Safety Camera Systems that reduces risk of harm for all road users by 2030 (from 2018 baseline)	4. To improve public attitude towards Safety Camera as part of safe systems, measured as an increase in social license for safety cameras by 2030 (from 2018 baseline)	5. To Maximise return on investment in Safety Camera Systems for public including DfIs cost to the society by 2030	2.1 Meet business needs	2.2 Meet service requirements	2.3 Fit with Road to Zero strategy, Waka Kotahi Strategy, and MoT Transport objectives	2.4 Technical	2.5 Safety and design	2.6 Sustainability	3.1 Capital/Operational/Maintenance Cost	4.1 Supplier Capacity & capability	5.1 Scheduling/programming	6.1 Environmental effects	6.2 Social and cultural impacts	6.3 Climate change mitigation (mandatory)	6.4 Climate change adaptation	6.5 Cumulative impacts	6.6 Impacts on Te Ao Māori (mandatory)	6.7 Property impacts	6.8 Fatal Rates	7.1 Potential Value for Money	A1. Constraints the limitation we face	A2. Potential Dependencies - the things that must be in place and/or managed elsewhere	A3. Assumptions	Summary of decision made - SWOT	Progress or discontinue this alternative/option?			
1	Scoping	Do nothing	0	Keep Operating as Police and Waka Kotahi continue to fund an a. Note has total flow, as per, has requested for Wt to deliver the function	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0	<max>	Speed limit changes	0		0	Carried Forward			
1.1	Scoping	Minimum	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	-2	-2	-1	0	0	0	-1	0	0	0	1	3	3	0	0	0	0	0	0	0	No	0	<max>	Speed limit changes	1		1	Carried Forward		
1.2	Scoping	Intermediate	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	0	1	1	1	2	1	1	1	2	2	2	3	3	2	0	1	0	1	1	1	-1	No	1	<max>	Speed limit changes	26		26	Carry Way Forward (LWF)		
1.3	Scoping	Intermediate 1	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	0	2	2	2	3	2	2	2	1	1	2	2	1	1	0	2	0	3	3	3	-1	No	2	<max>	Speed limit changes	35		35	Carry Way Forward (LWF)		
1.4	Scoping	Intermediate 2	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	0	3	2	2	3	2	3	3	-1	-1	-1	1	1	0	0	1	0	1	1	2	-2	No	2	<max>	Speed limit changes	22		22	Carry Way Forward (LWF)		
1.5	Scoping	Maximum	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	1. Greater integration with Police and MoT 2. 8. 8 Based on cost of cameras by all recent info 3. Medium level of investment 4. Increase scope for both capability as 5. Not as flexible as Intermediate 6. Treat top 100 risk corridors 7. Some small change	0	3	0	0	0	3	3	3	-2	-2	-3	-1	-1	-3	0	0	1	1	-3	-2	No	1	<max>	Speed limit changes	1		1	Carried Forward			
2	Service Solution	Do nothing	0	Keep Operating as Police and Waka Kotahi continue to fund an a. Note has total flow, as per, has requested for Wt to deliver the function	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0	<max>	<max>	0		0	Carried Forward			
2.1	Service Solution	Minimum	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	0	0	-1	-1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	-1	No	0	<max>	<max>	0		0	Carried Forward		
2.2	Service Solution	Intermediate	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	1	1	1	1	1	1	1	3	3	2	2	2	3	0	0	0	0	0	0	-1	No	1	<max>	<max>	22		22	Carry Way Forward (LWF)		
2.3	Service Solution	Intermediate 1	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	2	3	2	3	2	2	2	2	2	1	1	1	0	1	0	0	0	0	2	-1	No	3	<max>	<max>	29		29	Carry Way Forward (LWF)		
2.4	Service Solution	Intermediate 2	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	2	3	2	3	2	2	3	1	1	0	-1	-2	0	-1	0	0	0	0	3	-1	No	1	0	0	17		17	Carry Way Forward (LWF)		
2.5	Service Solution	Maximum	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	3	0	0	0	3	3	3	-2	-2	-3	-3	-1	-3	0	-2	0	0	0	-1	-1	No	1	<max>	<max>	-2		-2	Discount		
3	Service Delivery	Do Nothing	0	Keep Operating as Police and Waka Kotahi continue to fund an a. Note has total flow, as per, has requested for Wt to deliver the function	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0	<max>	<max>	0		0	Carried Forward			
3.1	Service Delivery	Minimum	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	0	0	-1	0	1	1	1	2	0	0	0	1	2	0	-1	0	0	0	0	0	No	0	<max>	<max>	6		6	Carry Way Forward (LWF)		
3.2	Service Delivery	Intermediate	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	No	0	<max>	<max>	4		4	Carried Forward	
3.3	Service Delivery	Intermediate 1	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	0	0	0	0	1	1	1	-1	0	0	0	0	0	0	0	0	0	0	0	-1	No	0	<max>	<max>	2		2	Carry Way Forward (LWF)		
3.4	Service Delivery	Intermediate 2	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	0	0	-2	0	1	-1	1	1	0	0	0	0	0	0	-2	0	0	0	0	0	-1	3	Yes	0	<max>	<max>	-1		-1	Discount
3.5	Service Delivery	Maximum	1. LfIs & DfIs from Police (not case) 2. Min more over group investment 3. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 4. 9, 92, 900, 1 by 2030 5. Low level of investment	1. LfIs & DfIs from Police (not case), with no camera expansion 2. Almost 1 mile to run ICT investment (part from what's req not to keep Police functions going as it 3. 9, 92, 900, 1 by 2030 4. Low level of investment	0	0	0	2	0	1	1	1	-1	0	0	0	0	0	0	-2	0	0	0	1	-3	No	0	<max>	<max>	-1		-1	Discount		

Alternative or option details					Investment objective					Critical Success Factors					Potential affordability	Supplier Capacity & Capability	Programme Timeline	Opportunities & Impacts								Programme-specific critical success factors	Limits/Constraints for each option			Summary of decision made			
Unique Identifier	Choice Dimension	Name of alternative/option	Detailed Description	Brief Description	1. To reduce average speed on roads that are treated with safety cameras, leading to a reduction in DSIs by 2030 (from 2018 baseline)	2. To improve the quality of Safety Camera Systems (effectiveness) service to the public by reducing DSIs due to compliance with speed limits by 2030 (from 2018 baseline)	3. To improve road user compliance to speed limits through Safety Camera Systems that reduces risk of harm for all road users by 2030 (from 2018 baseline)	4. To improve public attitude towards Safety Camera as part of safe system, measured as an increase in social license for safety cameras by 2030 (from 2018 baseline)	5. To Maximise return on investment in Safety Camera Systems for public by reducing DSI cost to the society by 2030	How long the alternative will be in place for	2.1 Meet business needs	2.2 Meets service requirements	2.3 Fits with Road to Zero strategy, Waka Kotahi Strategy, and MoT Transport objectives	2.4 Technical	2.5 Safety and design	2.6 Consentability	3.1 Capital/Operational/Maintenance Cost	4.1 Supplier Capacity & capability	5.1 Scheduling/programming	6.1 Environmental effects	6.2 Social and cultural impacts	6.3 Climate change mitigation (mandatory)	6.4 Climate change adaptation	6.5 Cumulative impacts	6.6 Impacts on Te Ao Māori (mandatory)	6.7 Property Impacts	6.8 Fatal Risks	7.1 Potential Value for Money	A1. Constraints the limitation we face	A2. Potential Dependencies - the things that must be in place and/or managed elsewhere	A3. Assumptions	Summary of decision made - SWOT	Progress or discontinue this alternative/option?
4	Service Implementation	Do Nothing	0	Police runs Safety Camera Operates no implementation required	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No	0	None	None		0	Carried Forward	
4.1	Service Implementation	Minimum	No Camera Expansion but a slow transfer of cameras across to Waka Kotahi	No camera expansion, but a slow transfer of cameras across to Waka Kotahi	0	1	1	-1	-1	1	1	-1	3	0	1	1	2	3	0	-1	0	0	0	0	0	0	No	1	None	None		11	Likely Way Forward (LWF)
4.2	Service Implementation	Intermediate	Phase Implementations 9(2)(g) cameras per year, and reaching 6 9(2)(g) by FY30	Phase Implementations 9(2)(g) cameras p.a.	0	1	1	-1	0	1	1	1	0	0	1	1	-1	-2	0	-1	0	0	0	0	0	0	No	1	None	None		3	Carried Forward
4.3	Service Implementation	Intermediate +1	1. Phase Implementation 9(2)(g) new camera p.a. 2. Takeover Police force loss by 2024 3. Expand camera to grade 6 9(2)(g) by 2030 4. Piggy back of other Road to Zero Programmes e.g. SP 5. Perform Co-ordinated Intervention across Waka Kotahi (build all the programmes and what they are trying to deliver that the treatment based on risk before being camera)	1. Phase Implementation 9(2)(g) new camera p.a. 2. Takeover Police functions by 2024 3. Expand camera to grade 6 9(2)(g) by 2030 4. Piggy back of other Road to Zero Programmes e.g. SP 5. Perform Co-ordinated Intervention across Waka Kotahi (build all the programmes and what they are trying to deliver that the treatment based on risk before being camera)	0	2	2	1	2	2	2	2	2	2	2	2	2	3	2	0	1	0	0	0	0	0	No	2	None	None		29	Likely Way Forward (LWF)
4.4	Service Implementation	Intermediate +2	1. Phase Implementation 9(2)(g) new camera p.a. 2. Takeover Police force loss by 2024 3. Expand camera to grade 6 9(2)(g) by 2030 4. Piggy back of other Road to Zero Programmes e.g. SP 5. Perform Co-ordinated Intervention across Waka Kotahi (build all the programmes and what they are trying to deliver that the treatment based on risk before being camera)	1. Phase Implementation 9(2)(g) new camera p.a. 2. Takeover Police functions by 2024 3. Expand camera to grade 6 9(2)(g) by 2030 4. Piggy back of other Road to Zero Programmes e.g. SP 5. Perform Co-ordinated Intervention across Waka Kotahi (build all the programmes and what they are trying to deliver that the treatment based on risk before being camera)	0	2	2	1	3	2	-1	-1	-1	0	1	-1	1	2	0	1	0	0	0	0	0	0	No	2	None	None		13	Carried Forward
4.5	Service Implementation	Maximum	1. All the roads to be 9(2)(g) by new year 2. Transfer in the same year as expansion 3. Expand at the same time to same year Waka Kotahi Road	High Speed of Expansion	0	3	3	-2	3	3	3	-1	-3	-3	-3	-3	-3	-3	0	-2	1	0	0	0	0	0	Yes	3	None	None		-4	Discount
5	Funding	Do Nothing	0	Hand Police work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Yes		None	None		0	Carried Forward
5.1	Funding	Minimum	Reduce the revenue generated from Safety Camera Systems to fund SCS Operations at Waka Kotahi	Handed to a lot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		None	None		0	Carried Forward	
5.2	Funding	Intermediate	CVPS - Road to Zero CVPS - Investment Management	WCTP Funded, CVPS through RZ and CVPS through Investment Management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No		Hand to Zero Funding (this is a reservation fund)	None		0	Likely Way Forward (LWF)
5.3	Funding	Intermediate +1	CVPS - Road to Zero CVPS - Road to Zero	WCTP Funded, CVPS and CVPS through RZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No		Hand to Zero Funding (this is a reservation fund)	None		0	Likely Way Forward (LWF)
5.4	Funding	Intermediate +2	Treasury funded Road to Zero - Waka Kotahi and The Treasury has said no	Treasury funded all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0		-3	Discount
5.5	Funding	Maximum	Public Private Partnership or Alternative procurement models	Alternative Procurement Models	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0		-2	Discount



Table 12: Final long-list options across MCA dimensions of choice after long-list workshop

Dimension	Do Nothing	Do Minimum	Intermediate	Intermediate + 1	Intermediate + 2	Maximum
1. Scope	1.1 – Keep operations at Police, and Waka Kotahi continues to fund as is. Note: Has fatal flaw, as government requested Waka Kotahi to take over the function	1.2 – Lift & shift Police functions as is with no camera expansion	1.3 – Risk-based treatment of high-risk corridors, implement § 9(2)(g) cameras across high-risk corridors	1.4 – Treat high- to medium-risk corridors § 9(2)(g) cameras by FY30 Note: May include legislative change, business intelligence enabled, and camera mixes	1.5 – Treat high- to low-risk corridors with § 9(2)(g)(ii) cameras by FY30 Note: May include legislative change, business intelligence enabled, and camera mixes	1.6 – Treat all corridors across the country with safety cameras Maximum investment, saturation of network with cameras with all technology turned on and business intelligence driven in real-time
2. Service Solution		2.2 includes: <ul style="list-style-type: none"> <li>• Lift &amp; Shift</li> <li>• New Offence Processing System</li> <li>• Same People (FTE Count same)</li> <li>• Same deployment and mobile capability</li> <li>• same System Integration</li> <li>• Face-to-Face Payment</li> <li>• Basic reporting with Police</li> </ul>	2.3 includes: <ul style="list-style-type: none"> <li>• New Operating Model</li> <li>• New Offence Processing System</li> <li>• New Camera Management System</li> <li>• Fibre + 5G CAM</li> <li>• No increase in people</li> <li>• Same mix of cameras</li> <li>• Same system Integration with Ministry of Justice as currently form Police</li> <li>• Face-to-Face Payment, and self-service payments</li> <li>• No customer experiences</li> <li>• No changes in business processes and automation</li> </ul>	2.4 includes: <ul style="list-style-type: none"> <li>• New Operating Model</li> <li>• New Offence Processing System</li> <li>• New Camera Management System</li> <li>• Risk Based Deployment of Cameras</li> <li>• Fibre + 5G CAM</li> <li>• Increase in People (FTE) by up to 40% max (but more technical people)</li> <li>• Different Mix of Cameras and mobile capability</li> <li>• System Integration with Ministry of Justice</li> <li>• Face-to-Face Payment, and self-service payments</li> <li>• Standard Customer Experience (uplift of 25%min)</li> <li>• Business intelligence enabled and automation (30% max)</li> </ul>	2.5 includes: <ul style="list-style-type: none"> <li>• New Operation Model</li> <li>• New Offence Processing System</li> <li>• New Camera Management System</li> <li>• Greater Social Licence to turn more of the capabilities of Cameras and tech platforms on to catch more than speed offences on the road</li> <li>• Straight through processing being utilised to greater degree and confidence in business operations</li> <li>• Risk-based camera deployment</li> <li>• Fibre + 5G CAM</li> <li>• FTE predominately technical people, with manual processing reduced to bare minimum</li> </ul>	2.6 includes: <ul style="list-style-type: none"> <li>• New Operating Model</li> <li>• New Offence Processing System</li> <li>• New Camera Management System</li> <li>• Fully integrated Realtime: (1) risk analysis, and (2) data sharing (100%)</li> <li>• Fibre + 5G CAM</li> <li>• Mostly technical FTEs (for example, Data scientists)</li> <li>• Different Mix of Cameras and mobile capability</li> <li>• Full integration with main government departments and crown agencies</li> <li>• Omni-channel payment suite</li> <li>• High level of customer experience (100%)</li> </ul>

Dimension	Do Nothing	Do Minimum	Intermediate	Intermediate + 1	Intermediate + 2	Maximum
				<ul style="list-style-type: none"> <li>Part-payments or alternative resolutions.</li> </ul>	<ul style="list-style-type: none"> <li>Greater mix of high-risk cameras that deliver greatest ROI (eg, average speed &amp; others)</li> <li>Seamless Integration with Ministry of Justice</li> <li>Face-to-face and self-service payments</li> <li>High level of customer experience (uplift of 25% min)</li> <li>Business intelligence-led and greater automation of tasks (50% max)</li> <li>Part-payments or alternative resolutions (support by AI &amp; good governance)</li> </ul>	<ul style="list-style-type: none"> <li>Centralised business intelligence process &amp; standardisation (100%)</li> </ul>
3. Service Delivery	3.1	3.2 Functions provided as follows: 1. Police in charge of: <ul style="list-style-type: none"> <li>Mobile Cameras</li> <li>Prosecutions</li> <li>Calibrations</li> </ul> 2. Waka Kotahi in charge of: <ul style="list-style-type: none"> <li>Static Cameras</li> <li>Business Intelligence Function 50%</li> <li>Outsource or Partner:               <ul style="list-style-type: none"> <li>Business Intelligence Function 50%</li> </ul> </li> </ul> Note: Level of outsourcing/partnership to	3.3 Functions provided as follows: 1. Police in charge of: <ul style="list-style-type: none"> <li>Calibrations retain 50% and we partner 50% (if possible)</li> <li>Cameras All</li> <li>Offence Processing</li> <li>Prosecution 50% (and we partner 50% if possible)</li> </ul> 2. Outsource or Partner: <ul style="list-style-type: none"> <li>Business Intelligence</li> <li>Prosecution 50% (partner if possible)</li> <li>Calibration 50% (partner if possible)</li> </ul>	3.4 Functions provided as follows: 1. Waka Kotahi: <ul style="list-style-type: none"> <li>Cameras All</li> <li>Offence Processing</li> <li>Prosecution 50% (and we partner 50%, if possible)</li> </ul> 2. Outsource or Partner: <ul style="list-style-type: none"> <li>Business Intelligence</li> <li>Prosecution 50% (Partner if possible)</li> <li>Calibration 100% (Partner if possible)</li> </ul> Note: Level of partnership to be developed further as not fully developed	3.5 Functions provided as follows: 1. Waka Kotahi <ul style="list-style-type: none"> <li>Business Intelligence – 50%</li> </ul> 2. Partner: <ul style="list-style-type: none"> <li>Cameras 100% (Fatal Flaw, can't do, as must retain core functions)</li> <li>Offence Processing – 100% (Fatal Flaw, can't do, must retain core functions)</li> <li>Prosecution – 100%</li> <li>Calibration – 100% (see, Limits &amp; constrains below)</li> </ul>	Functions provided as follows: 1. Waka Kotahi: <ul style="list-style-type: none"> <li>Cameras 100%</li> <li>Offence Processing 100%</li> <li>Prosecution 25% (and outsource 75%)</li> <li>Calibration 100%</li> <li>Business Intelligence 100%</li> </ul> 2. Outsource or Partner: <ul style="list-style-type: none"> <li>Prosecution 75%</li> </ul> Note: Level of outsourcing/partnership to be developed further as not fully developed

Dimension	Do Nothing	Do Minimum	Intermediate	Intermediate + 1	Intermediate + 2	Maximum
		be developed further as not fully developed	Note: Level of partnership to be developed further as not fully developed		<ul style="list-style-type: none"> <li>Business Intelligence – 50%</li> </ul> Note: Level of partnership to be developed further as not fully developed Note: Contains Fatal Flaw – can't move forward as can't outsource cameras	
4. Service Implementation		4.2 No Camera Expansion but a slow transfer of cameras across to Waka Kotahi	4.3 Phase Implementation s 9(2)(g)(ii) per year, and reaching s 9(2)(g)(ii) by FY30)	4.4 Phased Implementation s 9(2)(g)(ii) new cameras per year) <ul style="list-style-type: none"> <li>Takeover Police functions by 2024</li> <li>Expand cameras in parallel s 9(2)(g)(ii) by 2030</li> <li>Piggyback off other RtZ programmes (eg, Speed and Infrastructure – SIP)</li> <li>Perform coordinated intervention across Waka Kotahi (look at all programmes and what they are trying to do for that site treatment based on risk before installing cameras)</li> </ul>	4.5 Phased Implementation s 9(2)(g)(ii) new cameras per year) <ul style="list-style-type: none"> <li>Takeover Police functions by 2024 3. Expand cameras in parallel s 9(2)(g)(ii) by 2030</li> <li>Piggyback of other Road to Zero Programmes for example, SIP</li> <li>Perform coordinated intervention across Waka Kotahi (look at all the programmes and what they are trying to do for that site treatment based on risk before installing cameras)</li> </ul>	4.6 Big Bang expansion of s 9(2)(g) cameras in one year <ul style="list-style-type: none"> <li>Transfer in the same year as expansion</li> <li>Expand at the same time in same year</li> </ul> Note: Fatal Flaw
5. Funding	5.1 Fund Police as-is	5.2 s 9(2)(f)(iv)	5.3 NLTF Funded, CAPEX funded through RtZ and OPEX funded through Investment Management	5.4 NLTF funded, CAPEX and OPEX through RtZ	5.5 Treasury Funds all	5.6 Alternative Procurement Model – PPP

## WMCA short-list options analysis

Table 13: Scores of WMCA short-list options analysis

Analysis criteria	Option 1: Do nothing	Option 2: Do Minimum	Option 3: Less Ambitious Way Forward	Option 4: Preferred Way Forward	Option 5: More Ambitious Way Forward
1. Investment objectives (30 points)	0	6	19.2	26.4	30
1.1 To reduce average speed on roads that are treated with Safety Cameras, leading to a reduction in deaths and serious injuries (DSIs) by 2030 (from 2018 baseline)		1.2	3.6	4.8	6
1.2 To improve the quality of Safety Camera Systems (effectiveness) service to the public by reducing DSIs due to compliance with speed limits by 2030 (from 2018 baseline)		1.2	3.6	4.8	6
1.3 To improve road user compliance to speed limits through Safety Camera Systems that reduces risk of harm for all road users by 2030 (from 2018 baseline)		1.2	3.6	4.8	6
1.4 To improve public attitude towards Safety Camera as part of Safe System, measured as an increase in social licence for safety cameras by 2030 (from 2018 baseline)		1.2	4.8	6	6
1.5 To maximise return on investment in Safety Camera Systems for public by reducing DSIs cost to the society by 2030		1.2	3.6	6	6
2. Strategic fit (12 points)	0	4	7.2	10.4	10.4
2.1 Meet business needs		0.8	2.4	4	4
2.2 Meets service requirements		0.2	2.4	2.4	2.4
2.3 Fits with Road to Zero (RtZ) strategy, Waka Kotahi strategy, and Ministry of Transport objectives		0.8	2.4	4	4
3. Potential achievability (12 points)	12	12	8.8	8	7.2
3.1 Technical – people, process & technology	4	4	3.2	3.2	3.2
3.2 Safety & Design – for example, hazards, safety risk	4	4	2.4	2.4	2.4

Analysis criteria	Option 1: Do nothing	Option 2: Do Minimum	Option 3: Less Ambitious Way Forward	Option 4: Preferred Way Forward	Option 5: More Ambitious Way Forward
3.3 Consentability – level of consenting, complexity/difficulty & risks	4	4	3.2	2.4	1.6
4. Supplier capacity & capability (12 points)	12	12	12	8.4	4.8
4.1 Camera supplier – capacity & capability	6	6	6	4.8	3.6
4.2 Other providers – capacity & capability	6	6	6	3.6	1.2
5. Programme Timeline (16 points)	16	16	16	9.6	3.2
5.1 Programme delivery by 2030	16	16	16	9.6	3.2
6 Social, cultural & property Impact	0	0	1.2	3.6	3.6
6.1 Social impact – social licence (for example, Safety specific campaign, alongside RtZ, funded through System Management)			1.2	3.6	3.6
6.2 Cultural Impact – Te Ao Māori			1.2	3.6	
7. Potential value for money	3.2	3.2	9.6	12.8	3.2
7.1 Potential value for money – public value (for example, Social, economic & environmental)	3.2	3.2	9.6	12.8	3.2
8. Fatal flaw (Yes/No)					
8.1 Fatal flaw	Yes	No	No	No	No
<b>Final Weighted-MCA Score (110 points)</b>	<b>44</b>	<b>54</b>	<b>76</b>	<b>84</b>	<b>63</b>



Appendix 17 Detailed capital and operation costs

Detailed capital and operational costs for the short-listed options are set out in the following tables

Table 14: CAPEX costs – short-listed options

CAPEX items Cost (\$m)	Option 1: Do Nothing	Option2: Do Minimum	Option 3: Less Ambitious Way Forward	Option 4: Preferred Way Forward	Option 5: More Ambitious Way Forward
1. Camera network costs (over 20 years)					
New camera set-up costs	-				
Mobile cameras renewal costs	-				
Mobile camera site signage & safety costs	-				
2. Programme and technology costs (over 20 years)					
Programme change team costs	-				
CMS – vendor implementation costs	-				
CMS – ICT professional implementation costs	-				
IPS – vendor implementation costs	-				
IPS – ICT professional implementation costs	-				
Payment processing – Ministry of Justice implementation costs	-				
Payment processing – vendor implementation costs	-				
Waka Kotahi overheads	-				
Total CAPEX costs	-				
Total expected CAPEX costs (NPV)	-				

Table 15: OPEX costs – short-listed options

OPEX items Cost (\$m)	Option 1: Do Nothing	Option2: Do Minimum	Option 3: Less Ambitious Way Forward	Option 4: Preferred Way Forward	Option 5: More Ambitious Way Forward
1. Camera network costs (over 20 years)					
Camera operating costs					
Camera network costs					
Verification costs					
Enforcement costs					
Peak load penalty costs					
Infringement payment processing costs					
Calibration technology costs					
Operation cost – Police current cost					
2. Programme and technology costs (20 years)					
CMS – ongoing maintenance & support costs					
IPS – ongoing maintenance & support costs					
Waka Kotahi overheads					
Total OPEX costs					
Total expected OPEX costs (NPV)					

Appendix 18 Additional costs of each option from baseline

The table below breaks down costs in relation to the do minimum option for economic comparison of each option (that is, the additional cost and benefit produced by the option).

	Option 1: Do Nothing	Option 2: Do Minimum (Baseline)	Option 3: Less Ambitious Way Forward	Option 4: Preferred Way Forward	Option 5: More Ambitious Way Forward
	Leave the SCS with Police and continue to fund as is	Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS	Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS, new cameras on high-risk corridors	Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS, and new camera on high- to medium-risk corridors	Transfer the SCS from Police to Waka Kotahi, new operating model, new CMS, new IPS, new cameras on high- to low-risk corridors
WMCA scores	44	54	76	84	63
WMCA %	42%	51%	72%	79%	59%
Number of Police cameras	142	142	142	142	142
Number of new cameras	0	0	s 9(2)(g)(ii)		
Total cameras	142	142	242	812	1,642
Additional cost on top of 'do minimum' option)	s 9(2)(b)(ii)				
Total costs*, FY21–40 (20yrs)					
Additional benefit on top of 'do minimum' option)					
Total benefits*, FY21–40 (20yrs)					
DSIs by 2030	32	32	57	130	183
4% target (% of DSI target achieved)	1%	1%	2%	4%	7%
NPV costs*	s 9(2)(b)(ii)				
NPV benefits*					
BCR (non-PV)					
BCR (NPV)					

\* Costs and benefits are total, which include the additional cost of the option in them.  
WMCA = weighted multi criteria analysis

Appendix 19 Appraisal summary tables for short-listed options

Table 16: Appraisal summary for Option 4 – Preferred Way Forward

Appraisal Summary Table Template - Preferred Way Forward for SCS (Silver Option)

Date:	21/12/2021	Evaluation Period: (baseline and forecast year) e.g 2020 - 2060	20 year from FY2021-2040	Option Name:	Preferred Way Forward (PWF) - Option 4 (referred in IBC as the Silver Option). - New Operation Model - New CMS & IPS System - New cameras on high to med risk corridors s 9(2)(g)(ii) FY30)	This is the preferred option <input checked="" type="checkbox"/>
Problem/opportunity statement: Problem 1: We are not utilising safety cameras effectively which limits our ability to encourage compliance and reduce road DSIs Problem 2: Positive public attitudes towards accepting camera as part of safe system are required to ensure their utility and effectiveness is maximised.		Investment objectives: 1. To reduce average speed on roads that are treated with safety cameras (where safety cameras are deployed) leading to a reduction in DSIs by 2030 (from 2018 baseline) 2. To improve the quality of SCS (effectiveness) service to the public by reducing DSIs due to compliance with speed limits by 2030 (from 2018 baseline) 3. To improve road user compliance to speed limits through SCS that reduce risk of harm for all road users by 2030 (from 2018 baseline) 4. To improve public attitude towards Safety Camera as part of safe system, measured as an increase in social license for safety cameras by 2030 (from 2018 baseline) 5. To maximise return on investment in SCS for public by reducing DSIs cost to the country by 2030.		How project gives effect to GPS: This project delivers on GPS 2021 by: 1. Improves 'safety' – The SCS Programme is expected to improve compliance and reduce average speeds across the network thereby reducing deaths and serious injuries 2. Develops 'better travel options' – The SCS Programme will improve compliance to road safety (speed and driving behaviour), which will allow people to feel safer on the road and consider using alternative mediums of transport (other than cars) such as bicycle, e-bikes, scooters and others. 3. Improves 'climate change' – The SCS Programme will improve network speed across treated corridors (roads), which is expected to create uniform speeds and reduce amounts of - acceleration, de-acceleration, braking and over-taking. This change will lead to a reduction in greenhouse gasses and emission and improve climate change outcomes on NZ roads. 4. Improves 'freight connections' – The SCS Programme will support		How project gives effect to local community outcomes: National Project, which will impact local communities across the country in following ways: - reduce social cost to community through reduced DSIs - likely to create local roles as and when installing safety cameras across the regions.

1. Summary of Non-Monetised Impacts (Description)		2. Summary of Financial Impacts (nominal, non-discounted)		3. Summary of Monetised Option Impacts (present value, discounted)	
Non-monetised benefits noted below are still being developed, and are expected to be finalised by DBC: 1. Reduced emissions 2. Network efficiency 3. Improved processes 4. Emergency response 5. Cost avoidance 6. Overall network safety		Capital Costs: FY21-FY40	s 9(2)(b)(ii)		Total Monetised Benefits, excluding Wider Economic benefits (WEBs) - NPV of Benefits at 4% Disc. Rate
		Operating Costs: FY21-40			Total Monetised Benefits, including Wider Economic benefits (WEBs)
		Total Financial Costs: FY21-40			Total Economic Costs - NPV of Costs at 4% Disc. Rate
					CR (excluding WEBs)
					CR (including WEBs)

Transport Outcomes	Non-Monetised Impact: (description in numerical or narrative terms)			Monetised Impact: (non-NPV Benefit) (description in dollar terms in real terms, non-discounted)	
	Name of Measure:	Baseline:	Do Minimum Impact: by FY30	Option Impact: PWF by FY30	Do Minimum Impact: Option Impact: PWF
Healthy and safe people					
1.1 DSI reduction due to compliance with speed limits	1.1.4 Decrease in number of non-compliant vehicles (speed) in treated corridors and intersections		We expect little to no change in 'non-compliant vehicles' (speeding) in treated corridors and intersections	Expect around 20% decrease in non-compliant vehicles (speed) in treated corridors and intersections. Evidence: (1) Tang C. K. (2017). Do Speed Cameras Save Lives Evidence: (2) Mackie et al. (2017). Fatal footprints: understanding the safe system context behind NZ pedestrian road trauma.	
	1.1.5 Decrease in number of non-compliant vehicles on wider network		We expect little to no change in the number of 'non-compliant' vehicles on wider network	Expect around 20% decrease in number of non-compliant vehicles on wider network. Evidence: (1) Tang C. K. (2017). Do Speed Cameras Save Lives Evidence: (2) Blais E. & Carris L. (2015). Improving the safety effect of speed camera programme through innovations: evidence from the French experience.	
	1.1.6 Decrease in number of DSI in treated corridors and intersections		We expect little to no change in the number of DSI in treated corridors and intersections	Expect around 20% reduction in DSI in treated corridors and intersections Evidence: see pg. 19, Table [x]: Evidence of DSI reduction by different safety cameras	
	1.1.7 Decrease in number of DSI on wider network	Baseline from 2018 DSI No's: 378 Deaths and 2600 Serious Injuries = 2978 DSIs	By 2030 expected to have DSI savings of 4.1 p.a.	By FY2030 expected to have DSI saving of 114 p.a.	s 9(2)(b)(ii)
1.2 Reduce risk of harm for all road users	1.2.1 Decrease in mean speed on treated corridors and intersections		We expect little to no change in mean speed on treated corridors and intersections	Expect around 20% reduction in mean speed on treated corridors and intersections evidence: see pg.	
	1.2.2 Increase in perception of safety for all road users		We expect little to no change in perception of safety for all road users	Expect around 10% increase in perception of safety for all road users Evidence: Ellen D Pauw et al. (2014). An evaluation of the traffic safety effect of fixed speed cameras	
1.3 Social license for increased use of safety cameras	1.3.1 Contribution of cameras to reducing costs of DSIs		We expect little to no change in costs of DSIs from SCS	Expect SCS to contribute to around 4% reduction in DSIs by FY2030 for RTZ	
	1.3.2 Increase in support for increase in number of cameras		We expect little to no change in support for more cameras	Expect a minor increase in support for safety cameras, between 2% to 5%, from the public as they see the benefits or reduction in DSIs, coincided with a safety campaign	
1.4 Return on investment in safety cameras is optimised	1.4.1 Contribution of cameras to reducing costs of DSIs		We expect little to no change in cameras reducing costs of DSIs	Expect costs of DSIs to decrease by 4% and more post FY30	
	1.4.2 Contribution of cameras to success of overall RTZ programme		We expect little to no contribution from cameras for RTZ programme	Expect SCS to contribute 4% towards RTZ programme	
Resilience and security (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)					
		... type	... type	... type	... type
Economic prosperity (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)					
		... type	... type	... type	... type
Environmental sustainability					
8.1 Impact on greenhouse gas emissions	8.1.1 CO2 emissions	... type	... type	... type	... type
Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.					
Inclusive access					
12.1 Impact on Te Ao Māori	12.1.1 Te Ao Māori	... type	... type	... type	... type
Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.					
Rationale for option selection decision					
Option 4 (Silver option in the IBC) was recommended by Stakeholders as the preferred way forward for SCS programme. The rationale for option 4 includes: - scores the highest in weighted multi-criteria analysis, score of 84 points - contributes directly towards reducing DSIs and assists RTZ meet its 40% DSI objectives by 2030. This option has an appropriate level of investment and scale to create halo effect across the network to reduce DSIs. Creates and indirect benefit on public attitudes as by reducing DSIs significantly on the network the public in turn views the intervention as positive. - align strategically to Waka Kotahi's GPS and MoT healthy & safe people outcomes - achievable within timeframe of getting new cameras installed by 2030 s 9(2)(g)(ii) new cameras) - supplier has the capability & capacity to support WK achieve this objective - create a positive social license as public will see the benefit of DSI reduction on high risk corridors coupled with a new education campaign to make them aware of safety cameras.					



Table 17: Appraisal summary for Option 3 – Less Ambitious Way Forward

Appraisal Summary Table Template - Less Amibitious Way Forward (Bronze Option)

Date:

21/12/2021

Evaluation Period:  
(baseline and forecast year)  
e.g 2020 - 2060

20 year from FY2021-2040

Option Name:

More Ambitious, Preferred Way Forward (PWF) Option 5  
(referred in IBC as the Bronze Option).  
- transfer SCS from Police to WAK  
- New Operating Model  
- New CMS & IPS System  
- New Cameras on high risk corridors only s 9(2)(g)(ii)

This is the preferred option

☐

Problem/opportunity statement:

Problem 1: We are not utilising safety cameras effectively which limits our ability to encourage compliance and reduce road DSIs  
Problem 2: Positive public attitudes towards accepting camera as part of safe system are required to ensure their utility and effectiveness is maximised.

Investment objectives:

1. To reduce average speed on roads that are treated with safety cameras (where safety cameras are deployed) leading to a reduction in DSIs by 2030 (from 2018 baseline)  
2. To improve the quality of SCS (effectiveness) service to the public by reducing DSIs due to compliance with speed limits by 2030 (from 2018 baseline)  
3. To improve road user compliance to speed limits through SCS that reduce risk of harm for all road users by 2030 (from 2018 baseline)  
4. To improve public attitude towards Safety Camera as part of safe system, measured as an increase in social license for safety cameras by 2030 (from 2018 baseline)  
5. To maximise return on investment in SCS for public by reducing DSIs cost to the country by 2030.

How project gives effect to GPS:

This project delivers on GPS 2021 by:  
1. Improves 'safety' – The SCS Programme is expected to improve compliance and reduce average speeds across the network thereby reducing deaths and serious injuries  
2. Develops 'better travel options' – The SCS Programme will improve compliance to road safety (speed and driving behaviour), which will allow people to feel safer on the road and consider using alternative mediums of transport (other than cars) such as bicycle, e-bikes, scooters and others.  
3. Improves 'climate change' – The SCS Programme will improve network speed across treated corridors (roads), which is expected to create uniform speeds and reduce amounts of - acceleration, de-acceleration, braking and overtaking. This change will lead to a reduction in greenhouse gasses and emission and improve climate change outcomes on NZ roads.  
4. Improves 'freight connections' – The SCS Programme will support uniform speed across the network, reduce crashes

How project gives effect to local community outcomes:

National Project, which will impact local communities across the country in following ways:  
- reduce social cost to community through reduced DSIs  
- likely to create local roles as and when installing safety cameras across the regions.

1. Summary of Non-Monetised Impacts (Description)

Non-monetised benefits noted below are still beind developed, and are expected to be finalised by DBC:  
1. Reduced emissions  
2. Network efficiency  
3. Improved processes  
4. Emergency response  
5. Cost avoidance  
6. Overall network safety

2. Summary of Financial Impacts (nominal, non-discounted)

Capital Costs: FY21-FY40  
  
Operating Costs: FY21-40  
  
Total Financial Costs: FY21-40

3. Summary of Monetised Option Impacts (present value, discounted)

Total Monetised Benefits, excluding Wider Economic Benefits (WEBs) - NPV of Benefits at 4% Disc. Rate  
Total Monetised Benefits, including Wider Economic Benefits (WEBs)  
Total Economic Costs - NPV of Costs at 4% Disc. Rate  
BCR (excluding WEBs)  
BCR (including WEBs)

Transport Outcomes

Non-Monetised Impact:  
(description in numerical or narrative terms)

Monetised Impact: Benefit (non-NPV)  
(description in dollar terms in real terms, non-discounted)

Name of Benefit

Select the row above

Name of Measure:

Baseline:

Do Minimum Impact: by FY30

Option Impact: PWF by FY30

Do Minimum Impact:

Option Impact: PWF

Healthy and safe people

1.1 DSI reductin due to compliance with speed limits

1.1.1 Decrease in number of non-compliant vehicles (speed) in treated corridors and intersections  
1.1.2 Decrease in number of non-compliant vehicles on wider network  
1.1.3 Decrease in number of DSI in treated corridors and intersections  
1.1.4 Decrease in number of DSI on wider network

Baseline from 2018 DSI No's: 378 Deaths and 2600 Serious Injuries = 2978 DSIs

We expect little to no change in 'non-compliant vehicles' (speeding) in treated corridors and intersections  
We expect little to no change in the number of 'non-compliant' vehicles on wider network  
We expect little to no change in the number of DSI in treated corridors and intersections  
By 2030 expected to have DSI savings of 4.1 p.a.

Expect around 10% decrease in non-compliant vehicles (speed) in treated corridors and intersections.  
Expect around 10% decrease in number of non-compliant vehicles on wider network  
Evidence: (1) Tang, C. K. (2017). Do Speed Cameras Save Lives  
Evidence: (2) Blais, E., & Carnis, L. (2015). Improving the safety effect of speed camera programme through Innovations: evidence from the French experience.  
Expect around 10% reduction in DSI in treated corridors and intersections  
Evidence: see pg. 19, Table [x]: Evidence of DSI reduction by different safety cameras  
By FY2030 expected to have DSI saving of 114 p.a.

1.2 Reduce risk of harm for all road users

1.2.1 Decrese in mean speed on treated corridors and intersections  
1.2.2 Increase in perception of safety for all road users

We expect little to no change in mean speed on treated corridors and intersections  
We expect little to no change in perception of safety for all road users

Expect around 10% reduction in mean speed on treated corridors and intersections evidence: see pg.  
Expect around 5% increase in perception of safety for all road users  
Evidence: Ellen D Pauw et al. (2014). An evaluation of the traffic safety effect of fixed speed cameras.

1.3 Social license for increased use of safety cameras

1.3.1 contribution of cameras to reducing costs of DSIs  
1.3.2 Increase in support for increase in number of cameras

We expect little to no change in costs of DSIs from SCS  
We expect little to no change in support for more cameras

Expect SCS to contribute to around 2% reduction in DSIs by FY2030 for RtZ  
Expect a minor increase in support for safety cameras, between 0% to 2.5%, from the public as they see the benefits or reduction in DSIs, coupled with a safety campaign

1.4 Return on investment in safety cameras is optimised

1.4.1 Contribution of cameras to reducing costs of DSIs  
1.4.2 Contribution of cameras to success of overall RtZ programme

We expect little to no change in cameras reducing costs of DSIs  
We expect little to no contribution from cameras for RtZ programme

Expect costs of DSIs to decrease by 2% and more post FY30  
Expect SCS to contribute 2% towards RtZ programme

Resilience and security (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)

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Economic prosperity (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)

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Environmental sustainability

8.1 Impact on greenhouse gas emissions

8.1.1 CO2 emissions

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Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.

Inclusive access

12.1 Impact on Te Ao Māori

12.1.1 Te Ao Māori

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Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.

Rationale for option selection decision

Option 3 (Bronze option in the IBC) ranked 2 in the weighted multi-criterai analysis, and scoed 76 points. This option:  
- supports the investment objectives and has very high probability for treating all high-risk corridors by 2030.  
- likely to generate the greatest social license from public as treats high risk corridors without putting a lot of cameras around the country  
- supports in meeting Waka Kotahi 4% DSI target reduction by 2030 but doesn't meet it completely. In addition supports WK Safe System outcome and MoT's health & safe people outcomes  
- requires less consenting as instally cameras on high-risk corridors only  
- can be delivered and achieved on time, given only one supplier in the market

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WAKA KOTAHI NZ TRANSPORT AGENCY

Table 18: Appraisal summary for Option 5 – More Ambitious Way Forward

Appraisal Summary Table Template - More Ambitious Way Forward Option for SCS (Gold Option)						
Date:	21/12/2021	Evaluation Period: (baseline and forecast year) e.g 2020 - 2060	20 year from FY2021-2040	Option Name:	More Ambitious, Preferred Way Forward (PWF) Option 5 (referred in IBC as the Gold Option). - transfer SCS from Police to WAK - New Operating Model - New CMS & IPS System - New Cameras on high to low risk corridors s 9(2)(g)(i)	This is the preferred option <input type="checkbox"/>
Problem/opportunity statement:  Problem 1: We are not utilising safety cameras effectively which limits our ability to encourage compliance and reduce road DSIs Problem 2: Positive public attitudes towards accepting camera as part of safe system are required to ensure their utility and effectiveness is maximised.		Investment objectives:  1. To reduce average speed on roads that are treated with safety cameras (where safety cameras are deployed) leading to a reduction in DSIs by 2030 (from 2018 baseline) 2. To improve the quality of SCS (effectiveness) service to the public by reducing DSIs due to compliance with speed limits by 2030 (from 2018 baseline) 3. To improve road user compliance to speed limits through SCS that reduce risk of harm for all road users by 2030 (from 2018 baseline) 4. To improve public attitude towards Safety Camera as part of safe system, measured as an increase in social license for safety cameras by 2030 (from 2018 baseline) 5. To maximise return on investment in SCS for public by reducing DSIs cost to the country by 2030.		How project gives effect to GPS:  This project delivers on GPS 2021 by: 1. Improves 'safety' – The SCS Programme is expected to improve compliance and reduce average speeds across the network thereby reducing deaths and serious injuries 2. Develops 'better travel options' – The SCS Programme will improve compliance to road safety (speed and driving behaviour), which will allow people to feel safer on the road and consider using alternative mediums of transport (other than cars) such as bicycle, e-bikes, scooters and others. 3. Improves 'climate change' – The SCS Programme will improve network speed across treated corridors (roads), which is expected to create uniform speeds and reduce amounts of - acceleration, de-acceleration, braking and overtaking. This change will lead to a reduction in greenhouse gasses and emission and improve climate change outcomes on NZ roads. 4. Improves 'freight connections' – The SCS Programme will support uniform speed across the network - reduce crashes		How project gives effect to local community outcomes:  National Project, which will impact local communities across the country in following ways: - reduce social cost to community through reduced DSIs - likely to create local roles as and when installing safety cameras across the regions.
1. Summary of Non-Monetised Impacts (Description)		2. Summary of Financial Impacts (nominal, non-discounted)		3. Summary of Monetised Option Impacts (present value, discounted)		
Non-monetised benefits noted below are still being developed, and are expected to be finalised by DBC: 1. Reduced emissions 2. Network efficiency 3. Improved processes 4. Emergency response 5. Cost avoidance 6. Overall network safety		Capital Costs: FY21-FY40  Operating Costs: FY21-40  Total Financial Costs: FY21-40		Total Monetised Benefits, excluding Wider Economic Benefits (WEBs) - NPV of Benefits at 4% Disc. Rate Total Monetised Benefits, including Wider Economic Benefits (WEBs) Total Economic Costs - NPV of Costs at 4% Disc. Rate BCR (excluding WEBs) BCR (including WEBs)		
Transport Outcomes		Non-Monetised Impact: (description in numerical or narrative terms)			Monetised Impact: Benefit (non-NPV) (description in dollar terms in real terms, non-discounted)	
Name of Benefit	Select the row above	Name of Measure:	Baseline:	Do Minimum Impact: by FY30	Option Impact: PWF by FY30	Do Minimum Impact: Option Impact: PWF
Healthy and safe people						
1.1 DSI reduction due to compliance with speed limits	1.1.4 Decrease in number of non-compliant vehicles (speed) in treated corridors and intersections		We expect little to no change in 'non-compliant vehicles' (speeding) in treated corridors and intersections	Expect around 30% decrease in non-compliant vehicles (speed) in treated corridors and intersections. Evidence: (1) Tang, C. K. (2017). Do Speed Cameras Save Lives Evidence: (2) Mackie et al. (2017). Fatal footprints: understanding the safe system context behind NZ pedestrian road trauma.		
	1.1.5 Decrease in number of non-compliant vehicles on wider network		We expect little to no change in the number of 'non-compliant' vehicles on wider network	Expect around 30% decrease in number of non-compliant vehicles on wider network Evidence: (1) Tang, C. K. (2017). Do Speed Cameras Save Lives Evidence: (2) Blais, E. & Carnis, L. (2015). Improving the safety effect of speed camera programme through innovations: evidence from the French experience.		
	1.1.6 Decrease in number of DSI in treated corridors and intersections		We expect little to no change in the number of DSI in treated corridors and intersections	Expect around 30% reduction in DSI in treated corridors and intersections Evidence: see pg. 19, Table (x): Evidence of DSI reduction by different safety cameras		
	1.1.7 Decrease in number of DSI on wider network	Baseline from 2018 DSI No's: 378 Deaths and 2600 Serious Injuries = 2978 DSIs	By 2030 expected to have DSI savings of 4.1 p.a.	By FY2030 expected to have DSI saving of 114 p.a.	s 9(2)(b)(ii)	
1.2 Reduce risk of harm for all road users	1.2.1 Decrease in mean speed on treated corridors and intersections		We expect little to no change in mean speed on treated corridors and intersections	Expect around 30% reduction in mean speed on treated corridors and intersections evidence: see pg.		
	1.2.2 Increase in perception of safety for all road users		We expect little to no change in perception of safety for all road users	Expect around 20% increase in perception of safety for all road users Evidence: Ellen D Pauw et al. (2014). An evaluation of the traffic safety effect of fixed speed cameras		
1.3 Social license for increased use of safety cameras	1.3.1 contribution of cameras to reducing costs of DSIs		We expect little to no change in costs of DSIs from SCS	Expect SCS to contribute to around 6% reduction in DSIs by FY2030 for RtZ		
	1.3.2 Increase in support for increase in number of cameras		We expect little to no change in support for more cameras	Expect a minor increase in support for safety cameras, between 5% to 10%, from the public as they see the benefits or reduction in DSIs, coupled with a safety campaign		
1.4 Return on investment in safety cameras is optimised	1.4.1 Contribution of cameras to reducing costs of DSIs		We expect little to no change in cameras reducing costs of DSIs	Expect costs of DSIs to decrease by 6% and more post FY30		
	1.4.2 Contribution of cameras to success of overall RtZ programme		We expect little to no contribution from cameras for RtZ programme	Expect SCS to contribute 6% towards RtZ programme		
Resilience and security (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)						
		... type	... type	... type	... type	... type
Economic prosperity (Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)						
		... type	... type	... type	... type	... type
Environmental sustainability						
8.1 Impact on greenhouse gas emissions	8.1.1 CO2 emissions	... type	... type	... type	... type	... type
Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.						
Inclusive access						
12.1 Impact on Te Ao Māori	12.1.1 Te Ao Māori	... type	... type	... type	... type	... type
Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.						
Rationale for option selection decision						
Option 5 (Gold option in the IBC) ranked 3 in the weighted multi-criteria analysis, and scored 63 points. This option: - meets the investment objective of reducing DSI by 4% by 2030. Has the highest level of investment and scale - likely to erode social license from the public as s 9(2)(g)(i) new cameras will be installed in a very short-span of time across the country (by FY30) - supports WK GPS and MoT Transport objectives - requires lots of consenting - carries the highest delivery risk and will be challenging to be achieved by a single supplier in the market, even if they have the capability but will lack capacity.						



## Appendix 20 Methodology for selecting camera sites

	Risk Analysis and Site Identification		RCA/Stakeholder Engagement		Moderation	Finalisation		Implementation	
	Risk Analysis	Site Identification	Workshop Preparation	Workshop Delivery	National Moderation & Feedback	Safety Camera Site Assessment and Validation	Sign-off	Detailed Site Design	Site Construction
Description	Analyse the road network to identify high risk corridors across both State Highways and Local Roads which would benefit from the implementation of safety cameras.	From the full list of high risk corridors, identify those to be considered as candidates for camera sites for this phase of safety camera network expansion. Load the candidate sites into the tool which will be used for RCA engagement.	Carry out activities to prepare for the engagement workshops, including identifying and contacting workshop attendees and providing preparation material.	Conduct engagement workshops with the appropriate RCAs and stakeholders to understand any planned infrastructure work related to each candidate corridor and determine the best mix of road safety interventions to be implemented. Record any decisions made and distribute meeting minutes for review and approval.	After all RCA and Stakeholder engagement has taken place, review the combined output of the engagement with a national all-of-network perspective, making any adjustments to the overall list as appropriate. Feed back to RCAs on the resulting nationally moderated camera site list.	For each proposed camera site, visit the site with RCA staff, vendors and relevant regional stakeholders to carry out a detailed assessment of the site for suitability for a safety camera. Start engagement with affected residents.	Acquire sign-off to proceed with implementation activities for a set of proposed safety camera sites.	Develop detailed site designs for confirmed safety camera interventions.	Details of the activities covered in this process are managed by SIP / Transport Services
Inputs	<ul style="list-style-type: none"> <li>Industry best practice and research in relation to site selection for safety cameras</li> <li>Road network data</li> </ul>	<ul style="list-style-type: none"> <li>Full list of SCS identified high risk corridors</li> </ul>	<ul style="list-style-type: none"> <li>Agreed regional engagement approach</li> <li>Long list of SCS identified high risk corridors which are candidates for safety cameras</li> <li>Engagement Workshop slide deck</li> <li>Principles for Safety Camera Site Selection</li> <li>Safety Camera Site Evaluation Criteria</li> </ul>	<ul style="list-style-type: none"> <li>Engagement tool pre-populated with High risk corridors identified by SCS and programme of work supplied by RCA</li> <li>Safety Camera Site Assessment checklist</li> <li>Waka Kotahi Principles for Safety Camera Site Selection</li> </ul>	<ul style="list-style-type: none"> <li>Outputs from the RCA and Stakeholder engagement workshops including</li> </ul>	<ul style="list-style-type: none"> <li>High risk corridors by region where preferred safety interventions include safety cameras</li> <li>Agreed regional engagement approach</li> </ul>	<ul style="list-style-type: none"> <li>Site Assessment and Validation Outcomes</li> </ul>	<ul style="list-style-type: none"> <li>Confirmed safety camera sites</li> <li>SCS / SIP Design and Build Agreement</li> <li>Collect site benchmark assessments</li> <li>Agreed regional engagement approach</li> </ul>	<ul style="list-style-type: none"> <li>Detailed site designs for sites on high risk corridors with confirmed safety camera interventions</li> <li>Construction Agreements</li> <li>Construction Plans</li> <li>Safety Cameras hardware and infrastructure</li> <li>Agreed regional engagement approach</li> </ul>
Outputs	<ul style="list-style-type: none"> <li>SCS Risk Analysis Methodology</li> <li>List of high risk corridors on both state highway and local roads. Ranked by Collective risk, including other key information eg: location, length, road type.</li> <li>Geospatial representation of the high risk corridors.</li> </ul>	<ul style="list-style-type: none"> <li>Candidate corridor list with relevant corridor information</li> <li>Candidate corridor set loaded into tools for engagement (PDT)</li> </ul>	<ul style="list-style-type: none"> <li>Attendees for workshop identified</li> <li>Workshop scheduled and attendees invited</li> <li>Preparation material provided to workshop attendees</li> <li>Engagement tool (PDT) confirmed to contain RCA programme of work</li> </ul>	<ul style="list-style-type: none"> <li>Agreed candidate corridors for safety cameras, including camera type and possibly deployment configuration</li> <li>Record of decisions and outcomes for each candidate corridor</li> <li>Meeting minutes</li> <li>Acceptance of meeting minutes and decisions from workshop attendees</li> </ul>	<ul style="list-style-type: none"> <li>An all-of-network list of camera sites incorporating any changes identified as necessary through moderation.</li> </ul>	<ul style="list-style-type: none"> <li>Completed safety camera site assessment and validation documentation (site assessment checklists, speed surveys, security assessment, network connectivity reports etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Signed approval to commence</li> </ul>	<ul style="list-style-type: none"> <li>Detailed site designs for sites</li> <li>Construction Agreements</li> <li>Construction Plans</li> <li>Building consents</li> <li>Approval from relevant authorities/RCA – including changes during construction</li> </ul>	<ul style="list-style-type: none"> <li>Constructed safety camera sites on high risk corridors</li> <li>Construction and safety audit documentation</li> </ul>
Participants	<ul style="list-style-type: none"> <li>SCS Programme Team</li> <li>Subject Matter Experts</li> <li>Geospatial vendor - Abley</li> </ul>	<ul style="list-style-type: none"> <li>SCS Programme Team</li> <li>SIP PDT Team</li> </ul>	<ul style="list-style-type: none"> <li>SCS Project team</li> <li>Workshop attendees</li> <li>Area Programme Manager</li> </ul>	<ul style="list-style-type: none"> <li>RCA(s)</li> <li>SCS Programme Team</li> <li>Workshop Attendees</li> </ul>	TBC	<ul style="list-style-type: none"> <li>SCS Programme Team</li> <li>RCAs</li> <li>Vendors</li> <li>Iwi/Hapu (where appropriate)</li> <li>Relevant stakeholders, including affected residents/public</li> <li>SIP, other Waka Kotahi programmes</li> </ul>	TBC	<ul style="list-style-type: none"> <li>SCS</li> <li>SIP</li> <li>Nominated engineering services provider(s)</li> </ul>	<ul style="list-style-type: none"> <li>SCS</li> <li>SIP</li> <li>Nominated construction services provider(s)</li> </ul>
Tools / Systems	<ul style="list-style-type: none"> <li>SCS Safety Camera Planning Tool</li> </ul>	<ul style="list-style-type: none"> <li>PDT</li> </ul>	<ul style="list-style-type: none"> <li>PDT</li> </ul>	<ul style="list-style-type: none"> <li>Safety Camera Planning Tool</li> <li>PDT</li> </ul>	TBC	<ul style="list-style-type: none"> <li>Safety camera site assessment checklists</li> <li>Site validation reports</li> </ul>	TBC	<ul style="list-style-type: none"> <li>TBC - Tools and systems required to support detailed design process</li> </ul>	<ul style="list-style-type: none"> <li>TBC - Tools and systems required to support construction process</li> </ul>

Appendix 21 Camera expansion locations

The Safety Camera System Programme has identified the candidate locations shown in the table below for the phase 1 camera expansion. The methodology for site selection is in Appendix 20

This list has been segmented to create tiered groupings of road controlling authorities (RCAs) based on the number of local road speed and red-light cameras in that jurisdiction:

- Tier 1 = RCAs with three or more local road speed and/red light cameras.
- Tier 2 = RCAs with one or two local road speed and/or red light camera
- Tier 3 = RCAs with no local road cameras but one or more state highway speed or red-light cameras.

This categorisation allows customisation of the engagement process based on the level of impact on that RCA.

Note that Auckland is excluded from this process as engagement has already occurred with Auckland Transport.

Tier	Territorial local authority	Speed cameras state highway	Speed cameras local road	Total speed camera corridors	Red-light cameras state highway	Red-light cameras local road	Total red-light cameras	Combined local road subtotal	Total Cameras
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Tier	Territorial local authority	Speed cameras state highway	Speed cameras local road	Total speed camera corridors	Red-light cameras state highway	Red-light cameras local road	Total red-light cameras	Combined local road subtotal	Total Cameras
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## Appendix 22 Additional information about SCS Programme workstreams

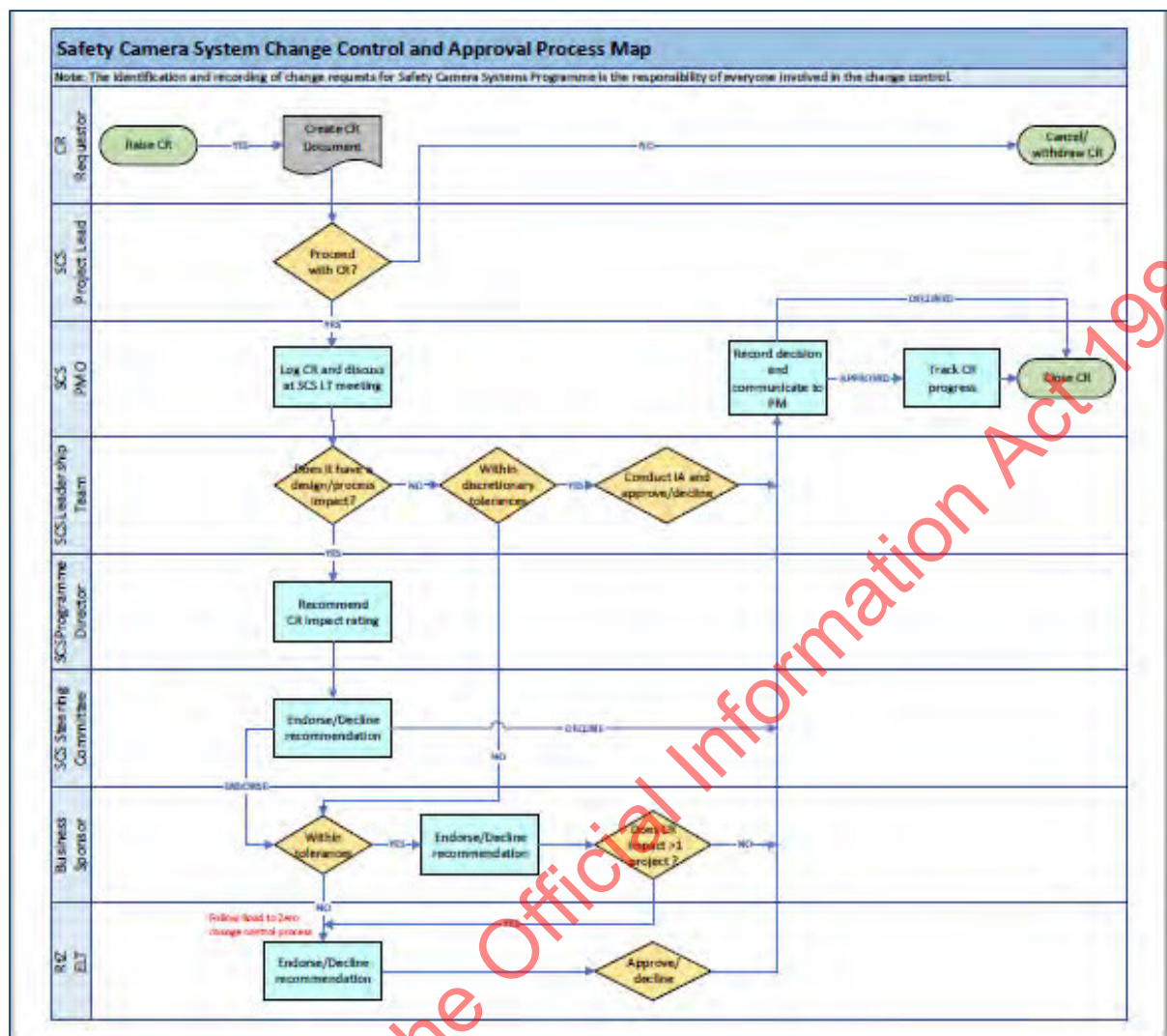
Workstream	Role
Design and Implementation	<p>Support the Design and Implementation workstream with change management plans to support the successful delivery of its scope.</p> <p>Change management activity will address the potential impacts to people while change interventions, tools and options will support an effective and smooth transition process, prepare people and mitigate the associated risks, including:</p> <ul style="list-style-type: none"> <li>• Stakeholder analysis and engagement plans.</li> <li>• Detailed impact assessments for the new or changed processes, policies and procedures.</li> <li>• Organisational readiness criteria and assessments to gauge preparedness. Develop and deliver plans to close readiness gaps.</li> <li>• Design &amp; Implementation change management plan to manage the people aspects of the workstream.</li> </ul>
People and Organisation	<p>When the design principles and critical success factors have been determined and the operating model options have been developed and considered, a decision can be made on future operating model of Waka Kotahi. Subsequently, more detailed impact assessments and stakeholder analysis and the next iteration of change and transition planning can be developed.</p> <p>Change management activity will address the impacts of the operating model chosen. Change interventions, tools and options will support an effective and smooth transition process, prepare people and mitigate the associated risks, including:</p> <ul style="list-style-type: none"> <li>• Detailed impact assessments (Waka Kotahi and New Zealand Police), and transition, workforce and people change planning.</li> <li>• Organisational readiness criteria and deliver assessments to gauge preparedness. Develop and deliver plans to close readiness gaps.</li> <li>• Transition strategy will include composition of the transition team using strategic inter-agency secondments, working groups etc.</li> <li>• High level organisation design development based on the operating model, high level processes and delivery area workforce and capability planning. Identify design issues and implications.</li> <li>• Support the delivery area to develop an integrated transition plan which coordinates readiness and transition activity across the workstreams for an effective and smooth transition process.</li> <li>• Support the due diligence process working with Waka Kotahi and New Zealand Police.</li> </ul> <p>There is also work that will need to be developed in conjunction with or under the guidance of other parties such as ER in the Waka Kotahi People Group. This includes developing a legally compliant people change and transfer process, detailed related planning, job matching, developing an appropriate employment offering and related offer documentation etc.</p>



Workstream	Role
Technology and Infrastructure	<p>The high-level change impact assessment assessed the technology and infrastructure workstream to have a high impact rating due to the comprehensive process and system impact.</p> <p>The new technology that will be implemented comprises three projects:</p> <ul style="list-style-type: none"> <li>• Safety Camera Management system</li> <li>• Offence Processing system</li> <li>• Camera Network expansion.</li> </ul> <p>Technology and Infrastructure planned change interventions:</p> <ul style="list-style-type: none"> <li>• Each project will need change planning to support the delivery of an integrated people, process and technology solution to deliver on programme objectives.</li> <li>• Business readiness criteria and plans will need to be developed covering technology deployment, data migration, capability gaps and solutions (induction, training and engagement activities).</li> <li>• Organisational readiness and support for change adoption will be required for the operationalisation of the new automated camera management and infringement processing systems, establishment of new asset management approaches, and customer interaction for infringements.</li> <li>• Develop and deliver plans to close gaps in readiness prior to going live.</li> <li>• Support for the design and establishment of an interim transition management team and approach to ensure effective testing of new systems and processes and a smooth transition process to business as usual.</li> <li>• Develop and define new digital and/or physical processes. Conduct detailed assessment of capability and capacity impact on current state.</li> <li>• Conduct a learning needs analysis per project and develop a learning plan to ensure that users are competent, feel confident and know how to access additional guidance and information. Support the development and ensure the appropriateness of operator guide materials including techniques, tools and enhanced skills.</li> <li>• Support the delivery area to develop an integrated transition plan which coordinates readiness and transition activity across the workstreams for an effective and smooth transition process.</li> </ul>
Transition/ Expansion	<p>Camera transition and expansion requires a dedicated change plan.</p> <p>Change management will support the development of key messages for the Stakeholder Engagement and Communications strategy to support effective engagement with external and internal stakeholders.</p> <p>Significant stakeholder engagement and consultation is necessary to facilitate the selection process for site confirmation, consents and development. Stakeholders include iwi and hapū, road controlling authorities, local government, AA and the public in the local communities of proposed sites.</p>
Strategy & Performance	<p>The Strategy &amp; Performance workstream is an enabler for the programme outlining strategy that will be delivered by the other workstreams.</p> <p>Because of this the change impact of the Strategy &amp; Performance workstream will be minimal and will not have a dedicated Change Management plan.</p>
Policy	<p>The Policy aspects of the Programme features are critical to enabling the SCS to deliver the full benefits and KPI's over the expansion period.</p>



## Appendix 23 Change control flowchart



## Appendix 24 Safety camera site selection methodology (Tackling Unsafe Speeds)

Note: The contents pages from the original document have been omitted and it has been re-formatted to align with the rest of the appendices.

The original document was written by Mark Stables (February 2021, version 2.0).



### Introduction

The New Zealand Transport Agency is in the process of assuming ownership of Safety Camera operations nationally. That ownership involves continuation of existing NZ Police operated camera enforcement along with the expansion of the Safety Camera network across New Zealand.

In order to expand the network, suitable locations for the installation and deployment of camera resources must be identified.

This document provides an overview of the selection process used in identifying those new sites. A detailed process description can be found in the [Site Selection Shortlisting Process](#) document.

### Strategic case

#### Introduction

In December 2019, the New Zealand Government adopted Road to Zero, its Road Safety Strategy 2020-2030. Fundamental to the strategy is the vision where no one is killed or seriously injured in road crashes in New Zealand. As part of the strategy, one of fifteen key initial actions is to improve road safety by tackling unsafe speeds.

To achieve this action, the Tackling Unsafe Speed (TUS) programme has been developed. The programme has two key workstreams,

- Regulatory Framework for Speed Management
- Automated Compliance (Safety Camera Transfer and Expansion)

Tackling unsafe speeds is part of the systems approach to reducing deaths and serious injuries on New Zealand’s roads.

This work also forms the foundational element of the Automated Compliance programme which is focused on increasing compliance with road rules using automated technology in a way that is future proofed to enable new and additional technologies to be added over time. The safety camera element of the TUS programme is therefore considered through a wider ‘automated compliance’ lens to enable wider outcomes to be realized into the future.

**Safety cameras**


The Tackling Unsafe Speed programme has brought a focus on assessing options for and identifying a preferred strategic approach to the expansion of the safety camera network along with the necessary supporting education, advertising, and signage components.

In developing options, the following investment principles have been adopted:

- Safety camera investments will be operational decisions for Waka Kotahi, consistent with the Road to Zero strategy and action plan.
- Safety cameras will be rolled out in phases over the next 10 years, with each phase informed by the effectiveness of previous safety camera rollouts and closely linked to infrastructure treatments.
- Waka Kotahi will determine the type of safety camera signage that will be installed, and this will require changes to the Traffic Control Devices Rule.
- Existing safety cameras will not be signed until the first phase of new cameras is rolled out, to allow for additional camera coverage of the network and a public engagement and education campaign to be carried out.
- The roll out of new safety cameras will be supported by clear communication with the public, highlighting the new approach. Waka Kotahi will need to prepare this engagement and education campaign.

**Automated compliance technology**

In developing this programme four types of automated compliance technology have been considered:

	<p>Red light or dual function red light / speed safety cameras</p>	<p>A red-light camera system typically uses radar or laser to track and capture vehicles running the red light. The primary radar or laser scans and tracks vehicles as they approach the intersection. If a vehicle crosses the stop line during a red-light phase, a camera photographs the rear of the vehicle. A second radar or laser (used for validation) ensures the photograph taken is of the breaching vehicle.</p> <p>Dual function cameras are capable of recording vehicles that run red lights and/or speed through intersections.</p>
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	<p>Average speed (point to point) safety cameras</p>	<p>Average speed safety cameras calculate and record a vehicle's average speed between two points along a stretch of road. Infringement notices are only issued if the average speed over that entire distance exceeds the legal limit. This gives an accurate reading of whether drivers are speeding over a sustained distance, rather than just at a single point.</p>
	<p>Static (fixed) safety cameras</p>	<p>These are the 'standard' safety cameras which most people experience.</p> <p>These cameras use a dual radar or laser system. Signals reflect off vehicles and back to the camera. One radar or laser identifies speeding vehicles by measuring vehicle speed three times in quick succession and taking the middle speed. The second identifies the lane the vehicle is in and double-checks the speed reading. If the vehicle is speeding, the camera takes a picture.</p> <p>The camera is also able to differentiate between vehicles such as heavy trucks and cars which have different speed limits. An infrared flash enables capture of number plate information in the dark.</p>
	<p>Mobile safety cameras</p>	<p>This is a safety camera which is housed inside a van allowing the system to be mobilised across the network.</p> <p>The cameras include a radar or laser system that measures vehicle speed and a flash for night-time photography. Traffic camera operators run the camera equipment from inside the vehicles and are able to observe any images taken and make adjustments to image quality when required. They cannot alter any of the settings or the speed at which a camera system takes a photograph.</p>

### Camera site selection

Waka Kotahi has been tasked with taking a different approach to the previous targeting of crash black spots to bring a more network wide approach to speed management. This requires a focus on areas of the network where the impact and effect of safety cameras can deliver savings in the number of DSI incidents across a corridor or section of roadway rather than at very localised crash black spots. The Safety Camera programme will initially focus on the top ten percent high risk areas of the national road network.

The placement of cameras becomes more critical as we look to increase the effectiveness of the equipment. Hand in hand with placement is the public perception around safety cameras in general, and more specifically, where they are placed. With a corridor-based safety increase we must take care when installing camera systems in areas that don't have a visible or plainly apparent safety issue, for example, placing cameras on long straight roads that don't have a speed related network safety risk. The focus should therefore be on areas where cameras are best able to influence driver behaviour in areas of the network where vehicle speed and the road environment are less than ideal. To ensure camera site selection is transparent site profile information sheets will be available that describe the rationale and reason for a camera being placed at a certain location. These information sheets will be available for all sites installed.



Speed profiles are also an important consideration in the site selection process. Cameras capture vehicles exceeding the speed limit (inclusive of any threshold in place), so risk areas where speed is a factor, but not in excess of the posted speed limit require careful consideration. Establishing mean and 85<sup>th</sup> percentile speeds in the area provides meaningful insight to driver behaviour. A mean or 85<sup>th</sup> percentile speed very close to the speed limit indicates that a number of motorists are exceeding the speed limit, therefore increasing the DSI risk in that area. The site selection criteria specifies a mean speed 85% of the posted limit for the area as a trigger.

Several camera-based speed management options are available including Average Speed, Fixed speed and Mobile speed camera systems. Average speed systems manage speed through measuring vehicle speed across an entire corridor, bringing more homogenous vehicle speeds and marked improvements in compliance with speed limits (based on international experience). While there are currently legislative barriers to operational average speed enforcement, there is scope to trial such systems as the necessary legislative adjustments are made.

While very localised, fixed and mobile safety cameras offer the ability to influence larger stretches of the network due to the 'halo' effect they have. New Zealand based research describes vehicle speed reductions for up to 1 kilometre either side of a camera, which allows installation of fixed or mobile sites to address risk as required within a corridor. Consideration of multiple fixed or mobile sites within a corridor may also be viable where average speed systems are impractical.

Taking a holistic approach to Tackling Unsafe Speeds involves considering infrastructure improvements and safety camera placement and influence in order to bring about reductions in DSI rates across the network. Proposed infrastructure improvement works must be considered prior to camera installation. Where improvements are planned within the very near future the cost and timing of installation must be weighed against risk. Should there be significant risk in an area it may still be viable to install a camera system in the interim. Infrastructure works are therefore an important part of the site selection process.

The following information outlines the site selection process to be followed when considering safety camera installation.

### *Site selection and prioritisation*

Abley Transportation Consultants (Abley's) completed an initial camera site risk location identification process, based on four camera types including Average Speed (s 9(2)(g)(i) sites), Fixed Speed (s 9(2)(g)(i) sites), Mobile Speed (s 9(2)(g)(i)) and Red-light/Speed camera systems. By differentiating the site lists by camera type, the specific potential DSI reduction by camera type could be explored.

During the ongoing development of the site selection criteria and process it was been decided the site selection process itself will not be based on camera type, but rather, by selecting the most appropriate and workable camera type for each identified risk area.

This ensures the treatment decision reflects the best possible intervention for each site, considering alternatives to camera installation as part of that appraisal.

### *Initial potential site identification*

#### *The initial site selection process methodology*

The site list generated by Abley's represents the initial risk ranked list of potential camera sites.

Deployment of cameras in the sites identified through this prioritisation process could result in significant reductions in deaths and serious Injuries from crashes as shown in table 2 below.



Camera type	DSI reduction
Average Speed	48%
Static	15%
Mobile	10%
Red Light	26%

**Table 2 – DSI savings by camera type**

Abley's provided a geospatial solution for displaying the corridors or sites identified selected for each camera type. The identified corridors represent those sections of roadway that meet the criteria and would deliver DSI reduction through deployment of safety cameras.

The free-flowing speed profile for each corridor is also considered as part of the site selection process.

Where mean travel speeds for a corridor are close to the speed limit they should be flagged as potential safety camera sites.

The site selection shortlisting process allows for individual camera system requirements (hardware limitations and requirements) to be addressed to ensure a camera system will operate correctly and reliably in its given location.

Collateral from the site selection process is the production of road safety intelligence that will be of use by partner agencies in targeting risk and developing appropriate interventions within their agency's scope of responsibility.

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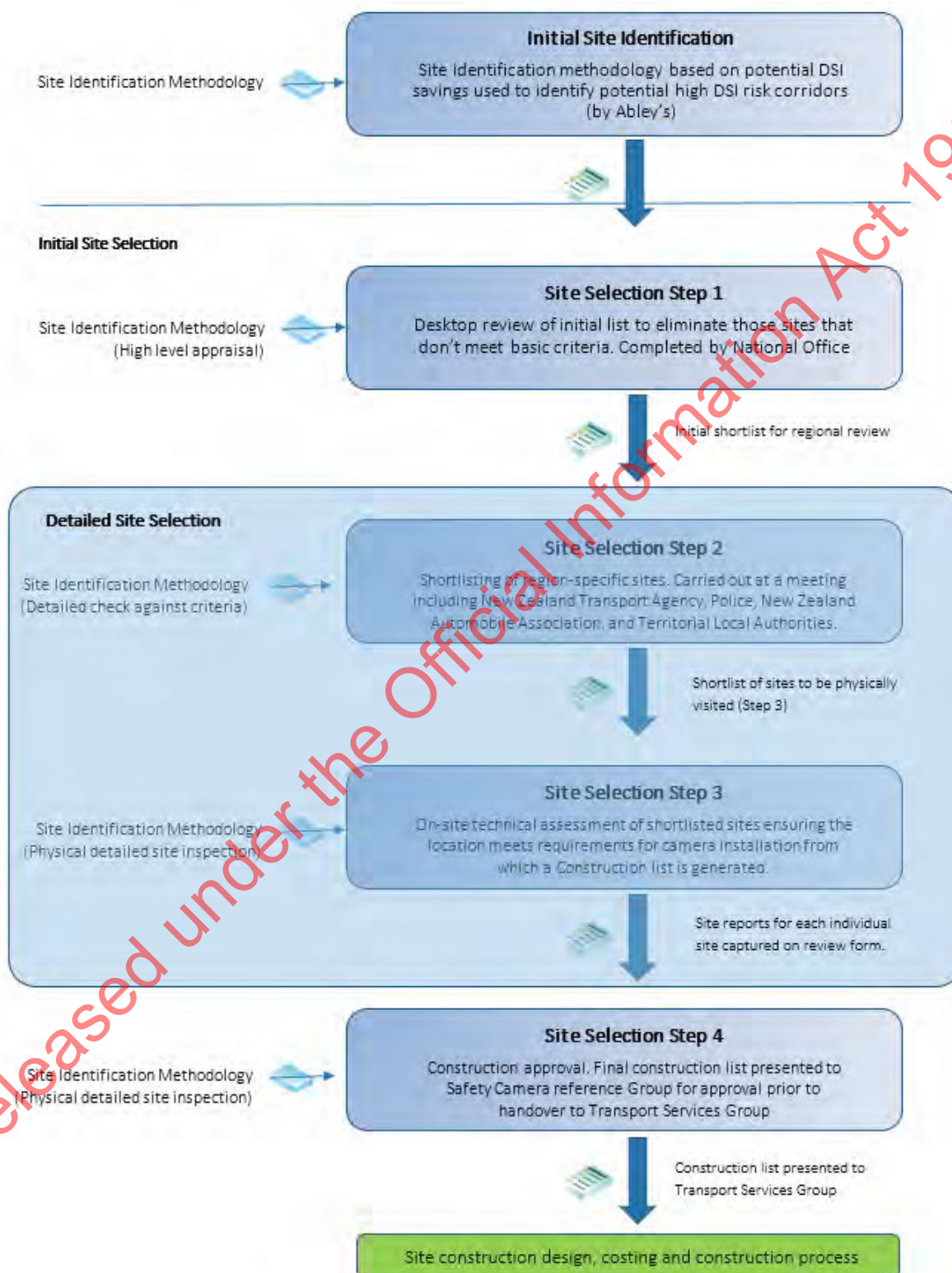
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### Safety camera site selection process

The intended outcome of camera deployment is a reduction in the DSI rate for the corridor. To achieve this outcome careful selection of the actual location of hardware installation is required. The process is outlined below.

See the [Site Selection Shortlisting Process](#) document for a detailed description of the process.



## ***Site selection shortlisting***

Shortlisting is a tiered process where identified candidate camera sites are assessed against operational criteria (camera hardware and site alignment/geographic requirements) to arrive at a final list of sites to be constructed and cameras installed. The process involves heavy engagement at a regional level to ensure local knowledge forms part of the installation decision.

The initial list provided by Abley's is first refined in a desk top exercise at a national level to generate the first shortlist. This shortlist is then taken to regions for the detailed shortlisting to be completed.

Regional site listing includes both desktop assessment and physical site visits.

The final shortlist is then presented to the Safety Camera Reference Group for approval to construct. The list of approved sites is the final site construction list.

### ***Site shortlisting process (outline)***

#### **Initial candidate sites**

The initial site identification by Abley's has identified several possible camera site locations. The sites identified form the first or initial high-level site list.

#### **Step 1 Initial Site Shortlisting**

The ranked list of initially confirmed sites are then considered against the second level criteria as per Table 3 below, which presents a more operational consideration of the sites asking the question "What type of camera be correctly and safely installed and operate the most effectively at this site?"

This step is a desk top exercise, performed using a geospatial visualisation tool, using images from the site itself. The Road to Zero spatial tool includes layers that display risk ratings within the corridor, allowing key risk areas to be highlighted on the map to narrow down installation decisions.

The area is viewed, and an initial visual appraisal is made against the criteria outlined in the Table 3.

Any planned infrastructure improvement works are also considered at this stage. Those sites that have planned works within the next two years are deferred or rejected for consideration after the infrastructure works have been embedded.

Those sites that appear to meet the criteria are confirmed as shortlisted sites.

#### **Step 2 Confirmed Shortlist**

The shortlist created following Step 2 is shared with regional RCA's, TLA's, Police and road safety partners (AA, RTA etc). A meeting is held where the shortlisted sites are individually considered with a regional focus. The site selection criteria from Step 2 is applied, but local knowledge is brought in to better inform the shortlisting process to ensure the identified site has the greatest potential positive impact on safety. The same planned infrastructure considerations must also be applied, particularly for TLA local roads.

Prior to the partners meeting, regional safety engineers are invited to provide initial consideration of the site list. This may result in some of the shortlisted sites being rejected prior to the partner meetings.

#### **Step 3 Confirmed site construction list**

A significant step in site selection is the physical inspection of the shortlisted sites.

The confirmed shortlisted sites are physically visited and approved/rejected based on the Step 2 criteria. GPS coordinates and measurements are captured for each site during the visit in order to confirm exact installation location. Those sites that don't meet the site selection criteria are rejected, resulting in the finalised construction list.

#### **Step 4 Approval of construction list**

The final construction list is submitted to the Safety Camera Reference Group for final approval.

## Step 5 Presentation of approved construction list to Transport Services Group

The final construction list is submitted to Transport Services group for construction planning, costing and implementation.

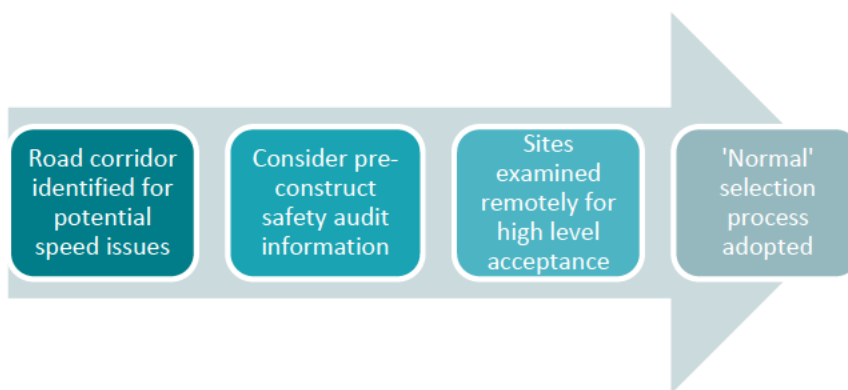
**Table 3 – Operational safety camera site criteria**

Criteria	Required standard/guidance
Travel speeds	Mean traffic free-flowing speeds are close (within 10km/h) of the speed limit
Equipment line of sight	Clear line of sight for camera, flash unit, radar beam.
Road Geometry	Straight road for 100m
	Constant slope for 100m
Road edge	>3m distance from edge line to camera
Cellular phone signal	Cellular signal strength at least '3G' level.
Site accessibility	Easy and safe access with no interference to traffic flows.
Proximity to speed limit signs and speed advisory signs	Provide distance to/from nearest speed limit signs in both directions from the camera installation location.
Power source	Power requirements within the range of 230-240VAC 24/7 availability
Sun strike	Camera unit faces south
Security	Acceptable security for equipment
Road safety	Equipment is protected from errant vehicles
Interference	No large permanent metal objects within the radar zone
	No temporary blocking objects. e.g. Bus stops
Underground services	Full disclosure of all underground services
Red-Light Camera	As above PLUS identification of the worst performing approach leg to the intersection

### ***New roads that don't have a 10-year crash history***

Those sites that don't have a crash history (typically newly constructed Expressways or Motorways) will not feature in the high-level site selection/identification process previously described. Such sites are prone to higher vehicle speed which can lead to increased speed related crash risk. These routes are generally ideally suited to Average Speed treatment to maintain compliance with speed limits. Although this is a traffic management approach to the use of Automated Enforcement Equipment, it is equally as important as the more traditional enforcement focus and has the same desired outcomes in road safety performance.

Without the benefit of existing network performance and safety ratings, site validation relies on a predictive approach. Pre-construct safety and safe system audits form the basis of the camera site corridor decisions. Once a potential corridor is identified the same shortlisting criteria process is applied.



### ***Additional camera sites***

On occasion there are requests for additional camera sites to be created to deal with specific or emerging speed related issues. In keeping with the operating ideal of reducing deaths and serious injuries, such requests must be worked through in line with the shortlisting process.

The sought site must sit within an identified risk corridor and meet all site selection criteria.

Should the request be for a location outside of the identified risk areas, Police should be advised so the issue can be addressed via officer-based enforcement.

### ***School zones***

A school zone is designated as a single named road, no more than 250m metres from the school boundary, on which any direct school access exists. Early childhood centres are deemed schools provided there is a road sign identifying the centres existence and location.

### ***Safety camera site performance reviews***

A critical component in any intervention is the measurement of success. The ongoing review of camera deployment will provide useful information when considering future camera-based enforcement and in determining the impact of automated enforcement on DSI rates where they are deployed.

Biannual DSI risk measurement should be conducted on all safety camera sites.

These reviews should focus on the following Key Performance Indicators:

- Reduction in DSI rates as compared to initial rates
- Reduction in mean speed<sup>2</sup>
- Reduction in journey interruptions due to traffic incidents
- Reduction in fatal and serious injury crashes and victims

Those sites that are not demonstrating safety improvements should be critically examined in order to establish likely reasons for poor impact performance. Consideration of other safety enhancements should be undertaken if it is deemed the safety camera is no longer appropriate.

### ***Seasonal influences***

Many locations in New Zealand have seasonal variance in traffic flows (such as the central North Island ski season and summer holiday locations). When conducting performance reviews the seasonal variance needs to be considered as the short-term influence may impact unfavourably across the full term of the review.

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<sup>2</sup> Speed surveys conducted using strip counters, Bluetooth counters or Google/TomTom data.