SNUG 2021 Queenstown

Hostile Vehicle Mitigation -
How can we do it safely in a central city environment?

Green Signal

SNUG 2021 Queenstown

Hostile Vehicle Mitigation -

- What is it?
- Why will we do it?
- Where will we do it?
- How do we do it?

Green Signal

SNUG 2021 Queenstown

What is Hostile Vehicle Mitigation?

Gunnebo's Hostile Vehicle Mitigation solutions include; vehicle security barriers, road blockers, security bollards and sliding automatic gates.

Our specialist HVM solutions have been successfully impact tested to PAS 68, IWA 14-1 & ASTM F2656 and are designed to protect perimeters and access points of critical infrastructure & public places including airports, oil & gas, financial institutes, government buildings, data centres, military bases, stadia and shopping malls.

Straight from the Gunnebo Website

Hostile vehicle mitigation is a barrier system designed to prevent a vehicle driving at up to 80km/hr from passing the barrier.

Green Signal

B4240
Green Signal

SNUG 2021 Queenstown

Why do Hostile Vehicle Mitigation?

Green Signal

SNUG 2021 Queenstown

Where will we do Hostile Vehicle Mitigation?

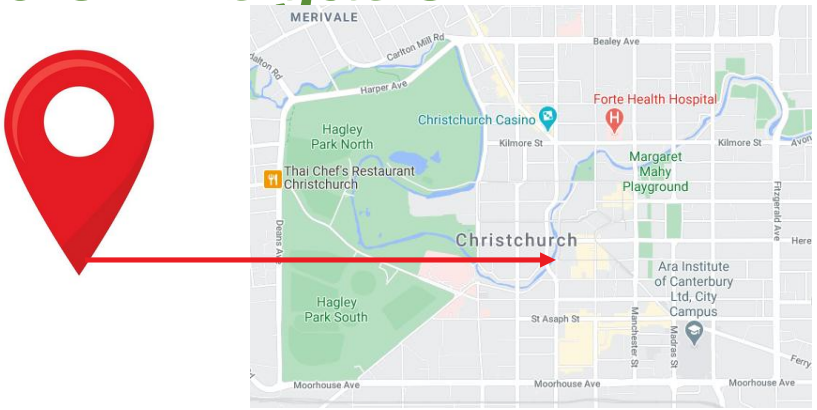
NZ Police advised that CCC need to install HVM bollards at the north end of Cashel mall (south of the Hereford / Oxford Intersection) to prevent an easy target for terrorists.
Hereford / Oxford is a complex site, with multiple challenges.

What issues can you spot in the following site pictures?

Green Signal

SNUG 2021 Queenstown

Where will we do Hostile Vehicle Mitigation?



SNUG 2021 Queenstown

Where will we do Hostile Vehicle Mitigation?

Green Signal

SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Who are the stakeholders?

- NZ Police
- FENZ
- St John
- Tram Operators
- Shop Owner Access
- Mall Store / Restaurant Users
- Courier Access
- Pedestrians
- Drivers
- Cyclists

Ability to Lock it down

Ability to Control Remotely

Ability to Open it up

Ability to work 24/7

Ability for public access during gazetted hours

Ability to keep the controls secure

Ability to use it safely

Ability to log who controls it

Ability to control access

Green Signal

SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Christchurch City Council

Green Signal

Hereford / Oxford Bollard Operations

Scope:	Operational Plan – CCC Bollards
Consultant:	Green Signal Ltd
Consultant Contact:	Sean Lewis 027 599 4584
Business Owner:	CCC
Date:	DRAFT V0.4 – 8 March 2021 (changes from Rev 0.3 highlighted in teal)
Dependent Documents	No dependent sheets

1. Introduction

In 2009 the Transport Operations team raised concerns that the Cashel Mall hours of access for vehicles were not being respected, and this was resulting in a hazard to pedestrians who were not expecting the vehicles to be present in the Mall area at certain times.
As part of the 'Loop Two' tram project started in 2010 bollards were installed at the intersection of Hereford / Oxford to automatically enforce the hours of access for vehicles into Cashel Mall. This was entirely for pedestrian protection.
This bollard system was never commissioned due to the effect of the 2011 earthquakes.

Following the mosque attacks on March 15 2019, and a global trend of terrorist acts being performed by vehicles into crowds, Police raised concerns to CCC over the risk to the public using the space along

DRAFT

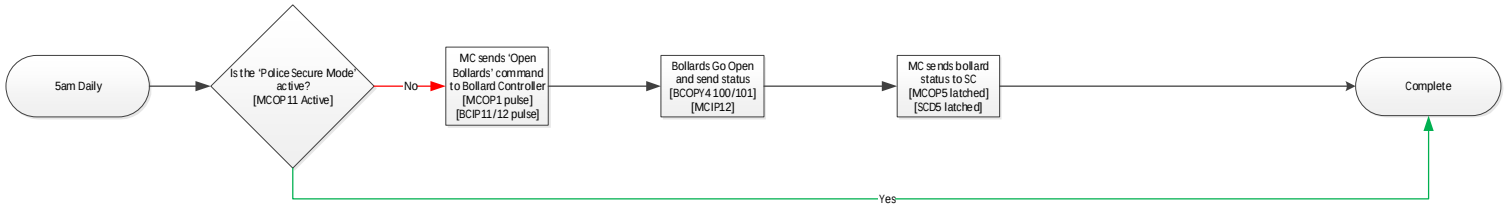
28 Page document detailing all aspects of how the system operates.
Includes 8 pages of details on operation from each type of user.
Then 5 pages of detailed flow-charts.
Finishes with the Signal Controller CIS (14 pages).

Green Signal

SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Timed Bollard Control – Open Bollards (1a)

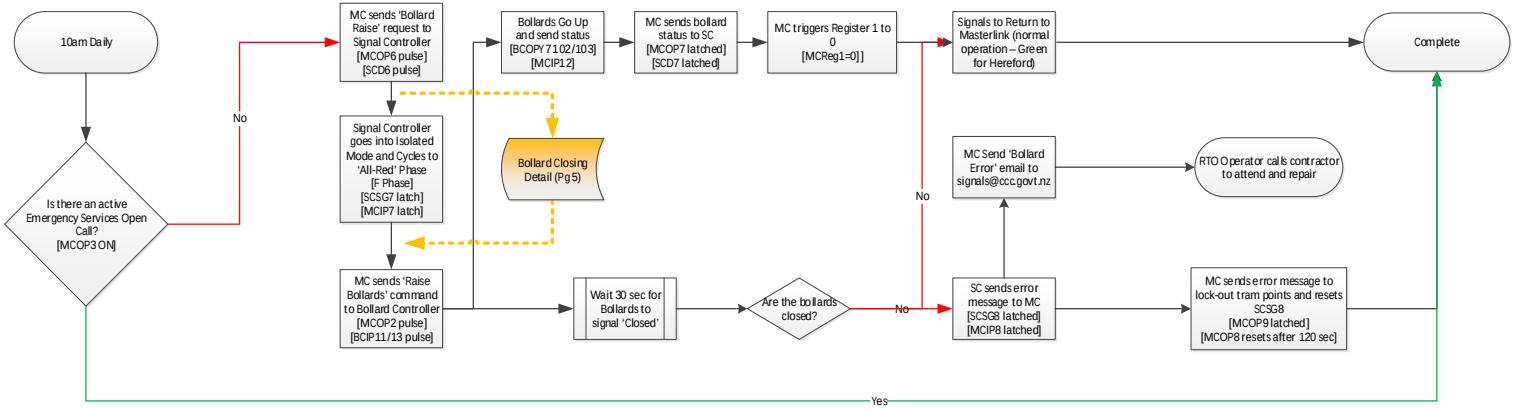


MC = Master Controller
MCIP1 = Input 1
MCOP1 = Output 1

SC = Signal Controller
SCD1 = Detector 1
SCSG1 = Signal Group 1

BC = Bollard Controller
BCIP 1 = Input 1
BCOP1 = Output 1

Timed Bollard Control – Close Bollards (1b)

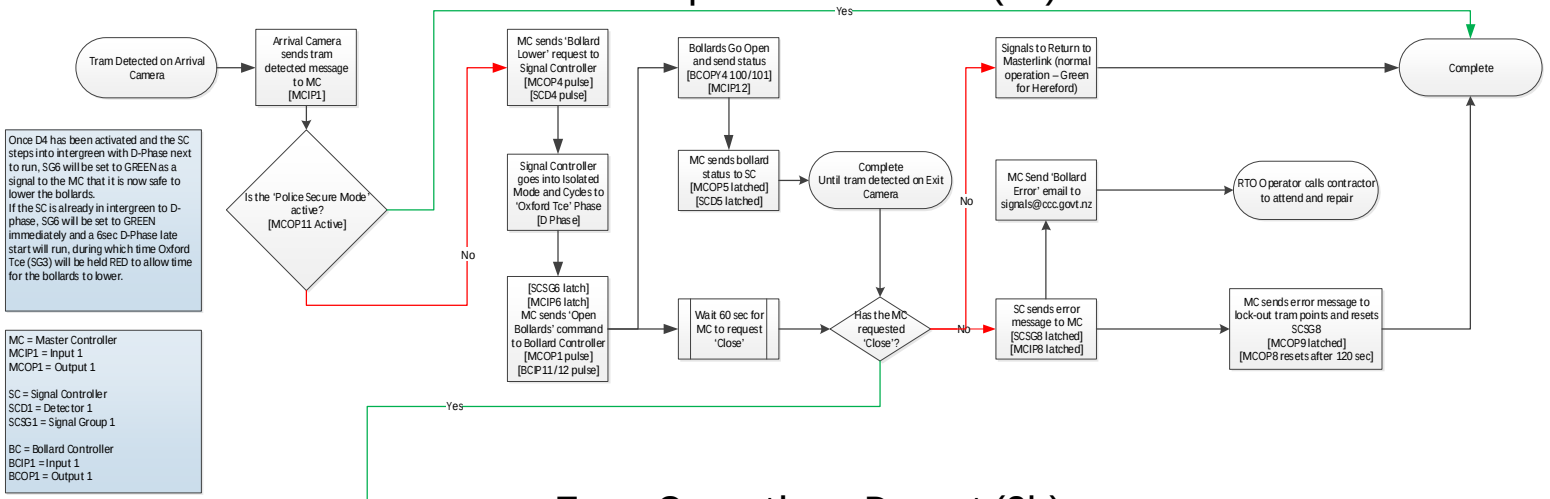


Green Signal

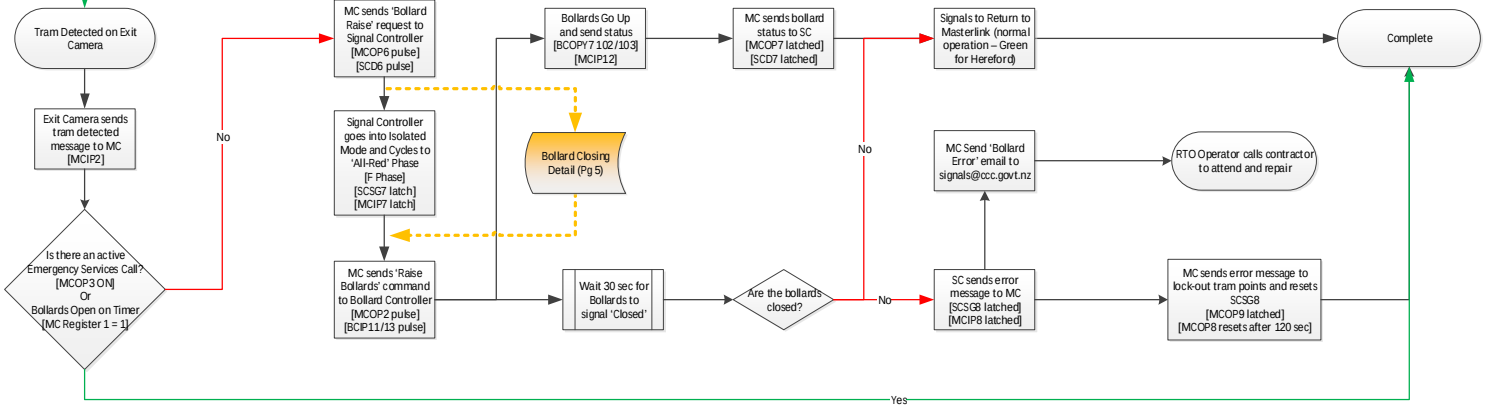
SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Tram Operation - Arrival (2a)



Tram Operation - Depart (2b)

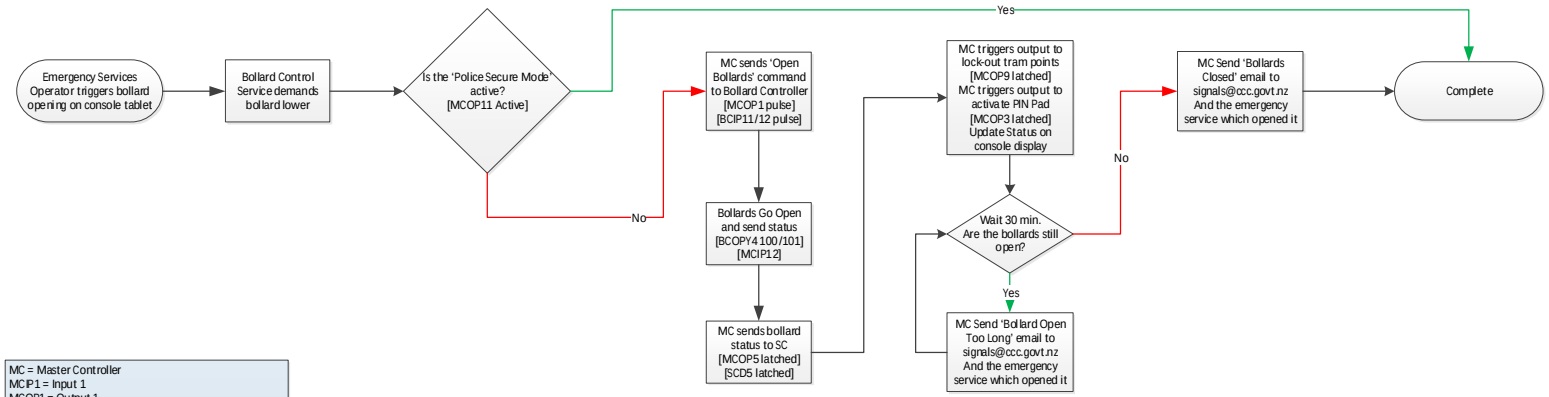


Green Signal

SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Emergency Services Operation – (Remote) Arrival (3a)

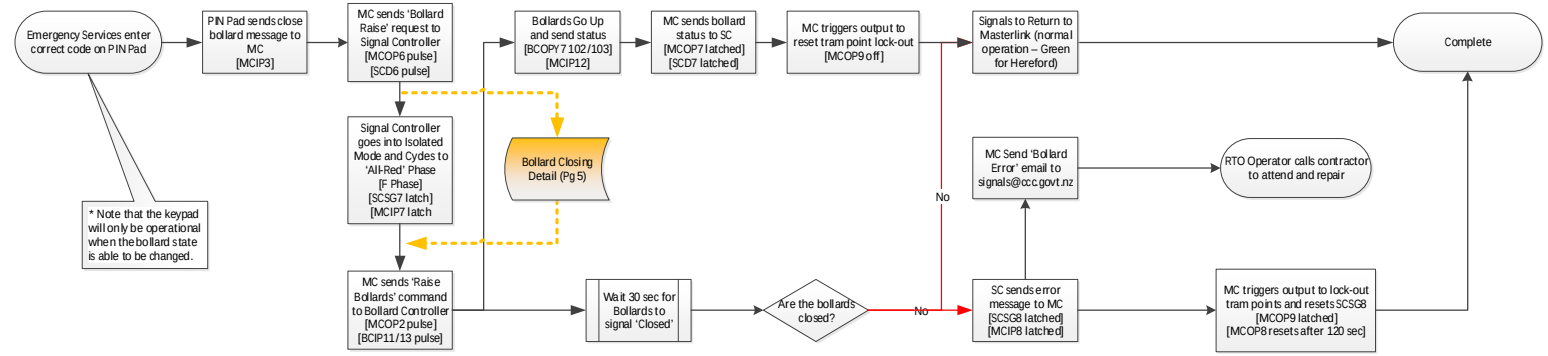


MC = Master Controller
MCIP 1 = Input 1
MCOP1 = Output 1

SC = Signal Controller
SCD1 = Detector 1
SCSG1 = Signal Group 1

BC = Bollard Controller
BCIP1 = Input 1
BCOP1 = Output 1

Emergency Services Operation - Depart (3b)

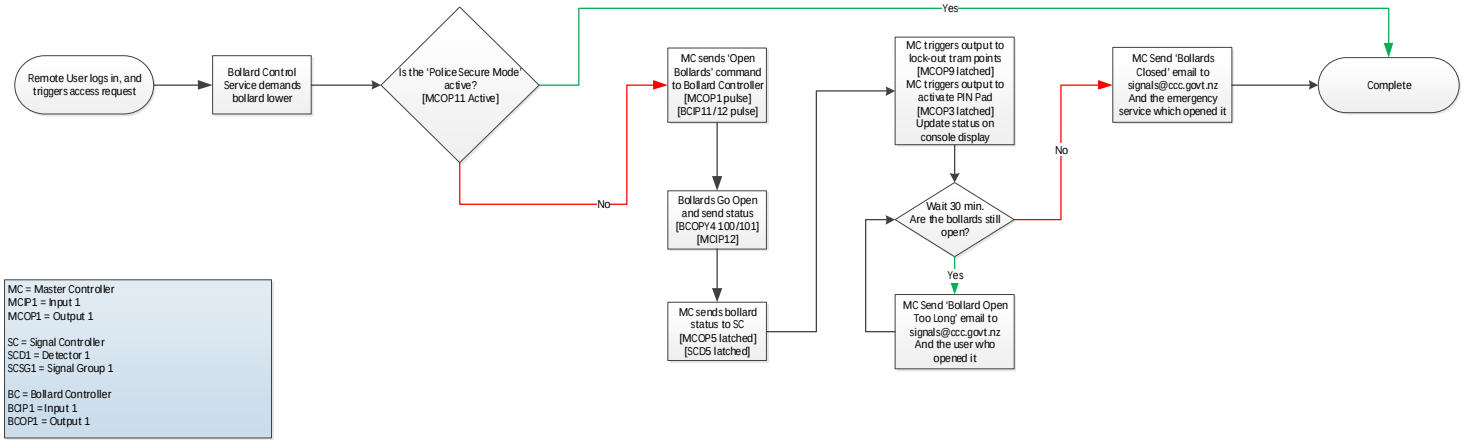


Green Signal

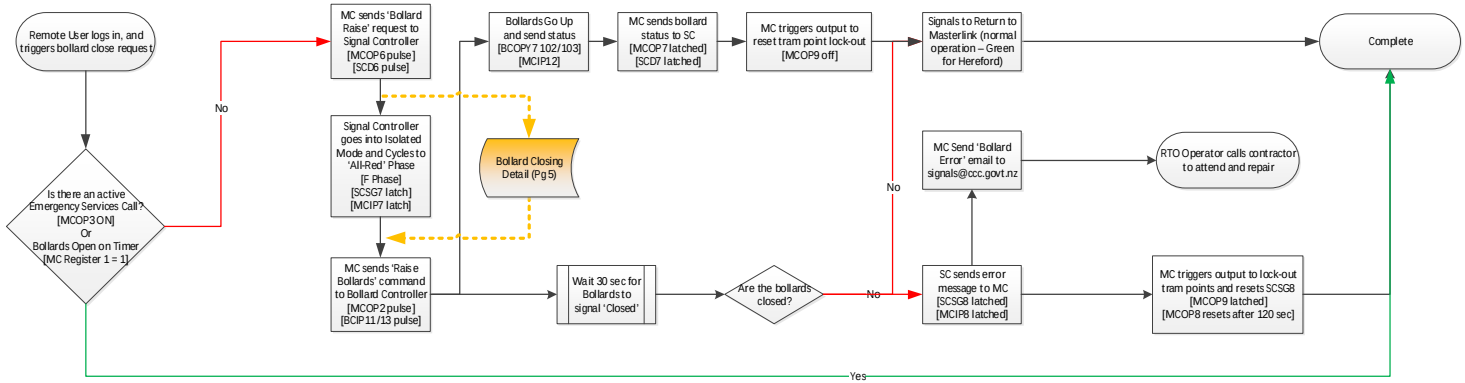
SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Remote Web Operation – (Remote) Arrival (4a)



Remote Web Operation (RTO or Emergency Services) - Depart (4b)



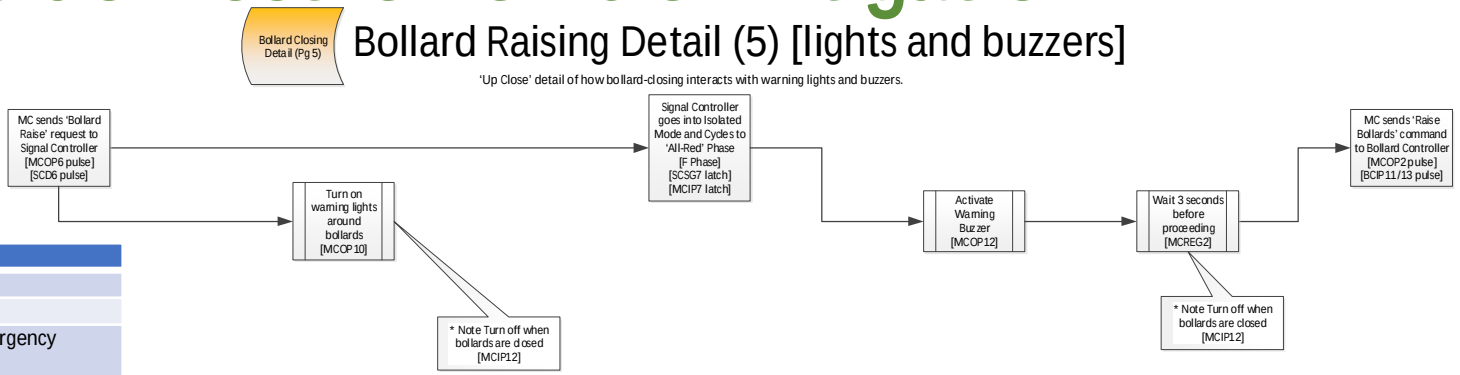
Green Signal

SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Bollard Raising Detail (5) [lights and buzzers]

'Up Close' detail of how bollard-closing interacts with warning lights and buzzers.



	Inputs		Outputs
1	CCTV1 – Tram Detected Open	1	Bollard Open Button (3 sec)
2	CCTV2 – Tram Detected Close	2	Bollard Close Button (3 sec)
3	Keypad Exit Request – 2 Sec trigger	3	Power to Exit PIN Pad & Emergency Mode indication
4	Bollard System / PLC Trouble / Fault	4	Bollards want to go down (D4 Signals)
5	Mains Fail (from UPS)	5	Bollards are down (D5 Signals)
6	Signals are ready, you can go down (SG6)	6	Bollards want to go up (D6 Signals)
7	Signals tell me I can go up (SG7)	7	Bollards are up (D7 Signals)
8	Signals have timed out – to long for bollard status (SG8)	8	Reset signals timeout fault message (D8 Signals)
9	Signals are in FY (SIG FY Relay)	9	Tram Point Lockout (signal to modem)
10	UPS Fault (from UPS)	10	Bollards about to close (in-ground warning lights)
11	Bollards are Open (Y4 100/101)	11	Police Secure Mode Active
12	Bollards are Closed (Y7 102/103)	12	Bollards about to close (warning alarm)
13		13	Police Secure Mode Active
14		14	
15		15	
16		16	
	Registers		Timers
1	+/- 1 on Timed Open Period	1	3 second delay for warning alarm
2	Tram Counter	2	30 sec timer for closing confirmation

Green Signal

SNUG 2021 Queenstown

How will we do Hostile Vehicle Mitigation?

Site Description:	Hereford/Oxford		Site No:	36
Last Updated:	14/08/2020	Version: V1R1	By:	Bill Sissons

Bollard Control Logic

* Bollards will lower independent of the signal controller (SC) for time-of-day or emergency operations.
* For tram operations, the bollards will only be allowed to lower when the signal controller is in or about to step into D-Phase.
* When a tram is detected by the Bollard Controller (BC), Det4 will be pulsed to request the SC cycle to D-Phase (Oxford Tce phase).
* Once Det4 has been activated and the SC steps into intergreen with D-Phase the next phase to run, SG6 will be set GREEN as a signal to the BC that it is now safe to lower the bollards.
* If the SC is already in intergreen to D-Phase, SG6 will be set GREEN immediately and a 6.0sec D-Phase Late Start will run, during which time Oxford Tce (SG3) will be held RED to allow time for the bollards to lower.
* When the bollards have been lowered, the BC will latch Det5. This can be used in the SCATS graphics to indicate that the bollards are down.
* While the bollards are down for a tram activation, the SC will HOLD the site in D-Phase green for the maximum time set in TSM9 (60sec).
* When the tram has cleared the bollards, the BC will pulse Det6 to request the SC to cycle to F-Phase (the All-Red phase) so that the bollards can be safely raised.
* Actuation of Det6 will result in the SC terminating D-Phase and moving directly to F-Phase.
* Once the SC steps into F-Phase, SG7 will be set GREEN to let the BC know that it is now safe to raise the bollards.
* Once the bollards are up, the BC will unlatch Det5 and pulse Det7. The SC will then release F-Phase and the site will return to normal operations.
* If Det 6 is not activated within 60sec of stepping into D-Phase, or if Det7 is not activated within 30sec of stepping into F-Phase, the SC will set SG8 GREEN and revert to normal operations. SG8 will only be reset to OFF by an activation of Det8.
* When Det4 is activated, the SC will set SG9 GREEN and set the operating mode to Isolated for SCATS purposes until Det7 is activated or SG8 is set GREEN.

* The following is a summary of the Bollard Inputs and Outputs:
* Bollard Inputs:
  Det4 - Request Bollards down
  Det5 - Bollards are down
  Det6 - Request Bollards up
  Det7 - Bollards are up
  Det8 - Reset after Bollard WD

* Signal Groups for Bollard Control
  SG6 - Bollards can go down
  SG7 - Bollards can go up
  SG8 - Response from Bollard not received (WD)
  SG9 - Bollard logic active for SCATS (VR30)

Vehicle Group and Ped Group Data

	Output Groups	Label	Name	Table	Phase	Remarks
SG 1	1	A/C	Hereford Ebd	3	AC	
SG 2	2	A/C*	Hereford Wbd	3	AC	
SG 3	3	D	Oxford	1*	D	RED in LS
SG 4	4	B/E Cyc	Oxford Cycle	3	BE	
SG 5	5	-	Cycle Call-Accept	NST	-	Grn if B or E demand
SG 6	6	-	Bollards can go down	NST	-	Set GRN to D & Det4 activated
SG 7	7	-	Bollards can go up	NST	-	Set Grn in F-Phase
SG 8	8	-	No Bollard response	NST	-	Set GRN if no Bollard response
SG 9	9	-	Bollard logic active	NST	-	For SCATS VR30
SG 10						

Special Notes

1	SG3 is held RED in D-LS if Bollard Down input activated during intergreen of the phase before.
2	SG6 is set GRN when a tram has been detected by the Bollard Controller (Det4 is activated) and the Signal Controller is in intergreen to D-Phase. SG6 is set back to AMB in D-Phase AMBER.
3	SG7 is set GRN when the Signal Controller steps into F-Phase. SG7 is set back to AMB in F-Phase AMBER.
4	SG8 is set GRN if SG6 is GRN and Det6 does not go active within the time set in TSM9 or SG7 is GRN in F-Phase but Det7 does not go active within the time set in TSM10. SG8 is set back to AMB once Det8 has been activated.
5	SG9 goes GRN when Det4 or Det6 become active and is used by SCATS to set the site Isolated (VR30). SG9 is set back to AMB when not in D-Phase or F-Phase.
6	PB1 & PB3 demand B-Phase in A-Phase and demand E-Phase in C or D Phases if in Masterlink or Flexilink and Z+ is set.
7	

Green Signal

CONNECT
SECURITY PRODUCTS®

SNUG 2021 Queenstown

Questions?