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SOCIETY CONTACT INFORMATION

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MINUTES OF MEETING HELD SATURDAY 22 FEBRUARY 2020, AT THE BOX HILL MINIATURE STEAM RAILWAY SOCIETY, ELGAR PARK, BOX HILL NORTH

Present: – Michael Formaini, Chris Gordon, Judy Gordon, Andrew Gostling, David Jones, Keith Lambert, David Langberg, Neil Lewis, Roo, Richards, Colin Rutledge, James Sinclair and Roderick Smith.

Apologies: – Glenn Cumming, Bill Johnston, David Langley, Phillip Miller, Laurie Savage, Brian Sherry, Peter Silva and Andrew Wheatland.

Visitors: – Floyd Bromley, Ayden Gordon, Jim Gordon and David Isherwood.

SRSV Committee Member David Langberg, took the chair & opened the meeting @ 13:00 hours, and welcomed everybody to the Box Hill Miniature Steam Railway Society.

General Business: – The February 2020 meeting consisted entirely of a visit to the Box Hill Miniature Steam Railway Society at Elgar Park in Box Hill North.

Members enjoyed a comprehensive tour of the facilities at the Box Hill Miniature Steam Railway Society including the signal box, rollingstock sheds, station building, workshop and the member's club rooms guided by David McMeekan (S&T Supervisor at BHMSRS).

David provided details of the signalling system and its operation in addition to other operational aspects of the railway.

The opportunity was taken to travel around the 1.2 kilometre dual gauge layout by train hauled by 7 ¼ inch gauge loco T400.

An enjoyable time was had by all.

No other business was transacted during the meeting.

At the conclusion of the visit, David Langberg thanked the Box Hill Miniature Steam Railway Society for their hospitality, especially BHMSRS member David McMeekan for his assistance during the day.

Meeting closed at approximately 15:00 hours.

The next meeting will be on Friday 20 March, 2020 at the Surrey Hills Neighbourhood Centre, Bedford Avenue, Surrey Hill, commencing at 20:00 hours (8.00pm).

MINUTES OF MEETING HELD FRIDAY 20 MARCH 2020, AT THE SURREY HILLS NEIGHBOURHOOD CENTRE, 1 BEDFORD AVENUE, SURREY HILLS, VICTORIA

Present: – Glenn Cumming, Graeme Dunn, Michael Formaini, Chris Gordon, Judy Gordon, Andrew Gostling, Bill Johnston, David Jones, Keith Lambert, David Langley, Neil Lewis, Andrew McLean, Laurie Savage and Rod Smith.

(Front cover) In July 1985 Spotswood signal box was still in regular use to control access to the Oil Sidings, the glass siding, and the interlocked gates across Hudsons Road. The box was originally opened on 23 May 1890 with a 19 lever Rocker frame, which was extended to 22 levers in 1923. The gates went in 1989, the connections to the Oil Sidings (former Powerhouse line) in 1994 and switchout facilities were provided in 1996. The glass siding and crossover were removed in 2001. The box was decommissioned at that time, but remains in situ. Photo Andrew Waugh

Apologies: – Jon Churchward, Graeme Cleak, Steven Dunne, David Langberg, Steve Malpass, Phillip Miller, Roo Richards, Colin Rutledge, Brian Sherry, Peter Silva, James Sinclair, David Stosser, Andrew Waugh and Andrew Wheatland.

Visitor: – Floyd Bromley.

The President, Mr. David Langley, took the chair and opened the meeting at 20:34 hours, following the 2020 Annual General Meeting.

Minutes of the November 2019 Meeting: – Accepted as published. Neil Lewis / Michael Formaini. Carried.

Minutes of the February 2020 Meeting: – Accepted as read. Neil Lewis / Michael Formaini. Carried.

Business Arising: – Nil.

Correspondence: – Invoice from Surrey Hills Neighbourhood Centre for the hire of the meeting room for 2020.

Payment sent to Surrey Hills Neighbourhood Centre for the hire of the meeting room for 2020.

Letter to Box Hill Miniature Steam Railway Society thanking them for hosting our visit on Saturday 22 February 2020.

Michael Formaini / Bill Johnston. Carried.

Reports: – Glenn Cumming reported that SRSV membership renewals are now due.

General Business: –Membership renewal forms for 2019 have been sent and renewals are now due.

Keith Lambert provided details about the various level crossing removal projects in the Metropolitan District. A summary of the discussion follows: –

- A seven (7) day occupation between Moorabbin – Mordialloc will allow the stations at Cheltenham and Mentone to be demolished. At Cheltenham the relay room and the room housing the control panel will remain until May 2020.
- More new signalling will be commissioned at the Pakenham East Depot this coming week.
- Facilities at Anstey to allow trains to terminate and turn back as part of the project to remove level crossings at Moreland and Coburg will be provided in July 2020 and will be controlled from Metrol.

Keith Lambert also reported that Coburg Signal Box and North Geelong "A" Signal Box had been demolished.

Rod Smith reported that new High Capacity Metro Trains had been tested between Upper Ferntree Gully and Belgrave. The testing included holding brake tests.

Wallan Loop. The recent derailment at Wallan Loop was discussed at length. The incident is now under investigation by the Australian Transport Safety Bureau. A preliminary report is expected to be released soon (released on 3 April 2020) and a final report will be released at a later date.

Meeting closed at 21:20 hours.

The next meeting will be on Friday 15 May, 2020 at the Surrey Hills Neighbourhood Centre, Bedford Avenue, Surrey Hill, commencing at 20:00 hours (8.00pm).

SIGNALLING ALTERATIONS

The following alterations were published in WN 7/20 to WN 15/20, and ETRB A circulars. The alterations have been edited to conserve space. Dates in parenthesis are the dates of publication, which may not be the date of the alterations.

10.02.2020 **Edithvale** **(SW 72/20, WN 7)**

On Monday, 10.2., the Denman Ave passive pedestrian crossing was permanently closed.

17.02.2020 **Cheltenham** **(SW 97/20, WN 7)**

On Monday, 17.2., Charman Road level crossing was temporarily closed to traffic and the level crossing equipment removed.

Down Home 14, the fixed Home at the Down end of the Up platform, was removed.

14.02.2020 **North Bendigo** **(TON 60/20, WN 7)**

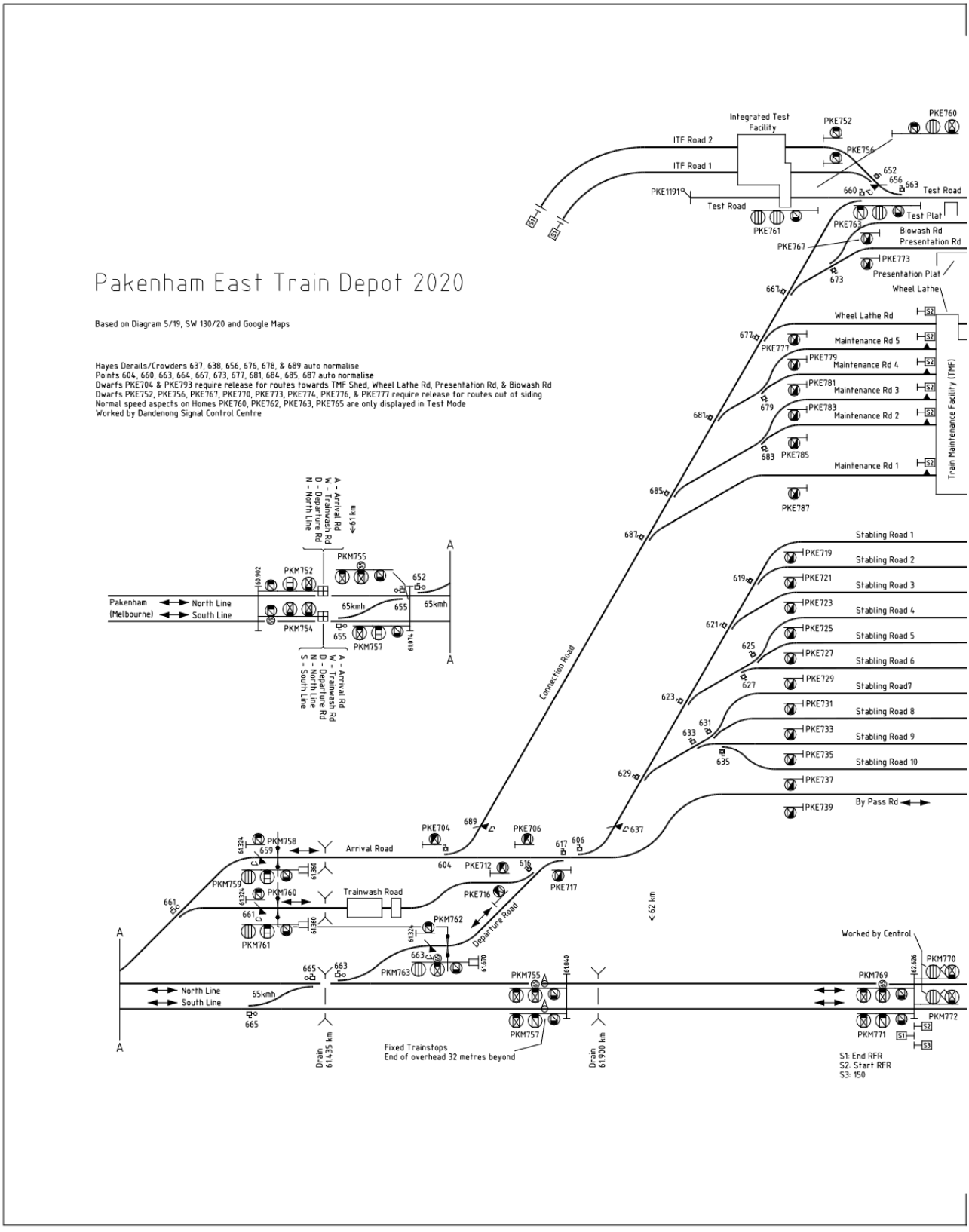
On Friday, 14.2., Siding D was booked out of service due to inadequate footpaths, non-compliant roll-out protection, and vegetation foul of transit clearance space. The points at the Up end are secured towards North Bendigo Workshops, and at the Down end for the main line.

(18.02.2020) **North Bendigo** **(SW 22/20, WN 7)**

Operating Procedure 116 (North Bendigo) was reissued. SW 20/20 (sic) is cancelled.

19.02.2020 **Stratford** **(SW 15/20 & 25/20, WN 7 & 8)**

On Wednesday, 19.2., commissioning of TPWS was finalised on the approaches to the Avon River bridge in connection with permanent speed restrictions. The speed restriction signs in the Down direction are at 221.083 km (90 km/h), 221.274 km (50 km/h), & 221.373 km (10 km/h). In the Up direction the speed



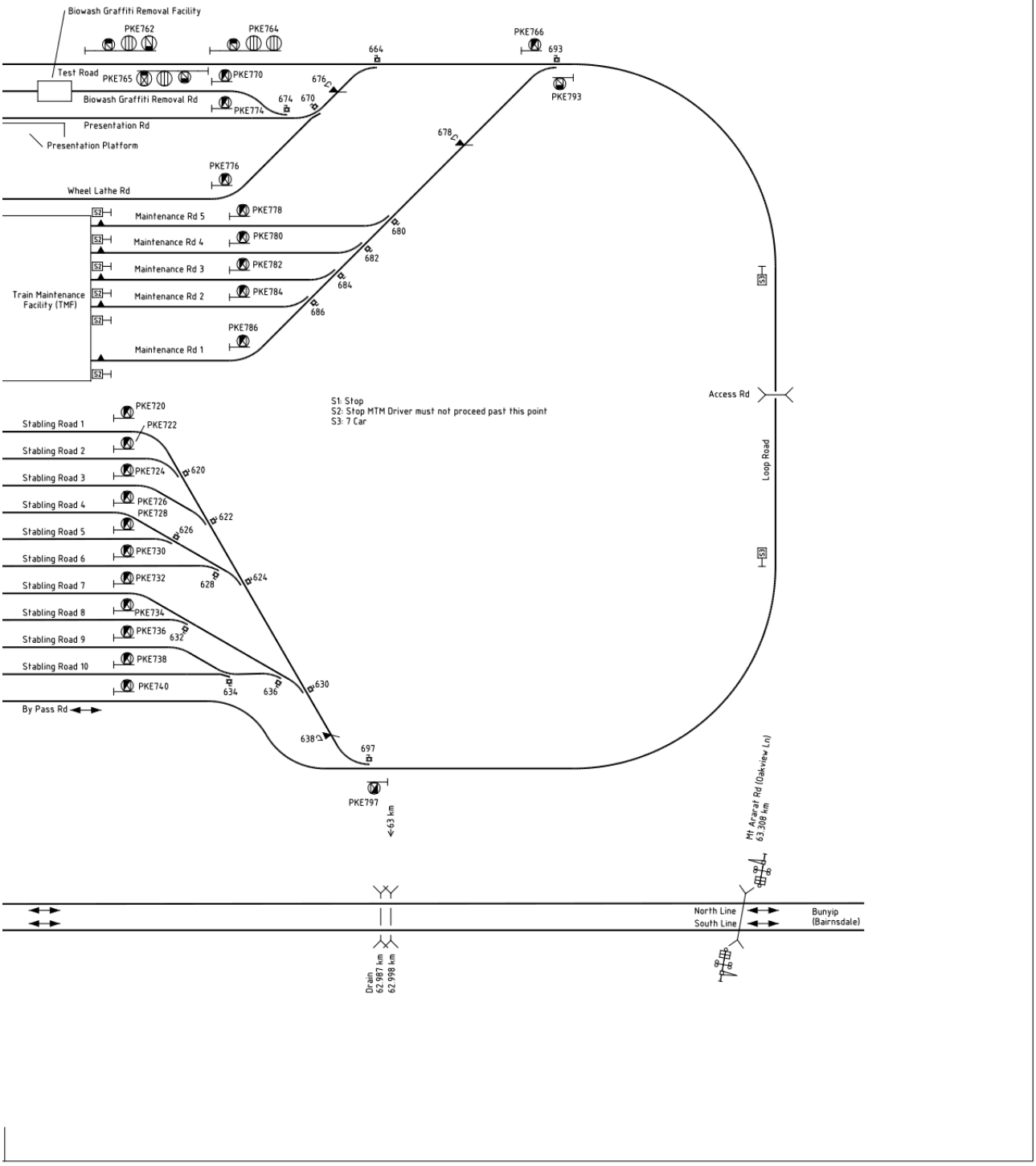
restriction signs are at 222.766 km (40 km/h) & 222.296 km (10 km/h). Diagram 44/19 (Stratford – Hillside) replaced 84/18.

24.02.2020 **Marshall** **(SW 23/20 & 28/20, WN 7 & 8)**

On Monday, 24.2., commissioning of TPWS was finalised in connection with speed restrictions (see SW 115/19). Diagram 46/19 (Marshall) replaced 36/17.

26.02.2020 **Buloke** **(SW 21/20, WN 7)**

On Wednesday, 26.2., boom barriers were provided at the existing flashing lights at Sunraysia Hwy (344.867 km). Operation is by axle counters. Healthy state indicator, yellow whistle boards, and remote



monitoring equipment was provided. The existing VicRoads AAWS was retained. A reset key switch for the axle counters was provided in the test switch box – see Operating Procedure 133.

Diagram 92/19 (Sutherland – Watchem) replaced 14/18. This also shows updated notice boards at Donald to mitigate short warning times for Up shunting trains at Campbell St (337.265 km)

02.03.2020 Southern Cross – Trial of new Purple LED (SW 29/20, WN 9)

Between Monday, 2.3., and Saturday, 7.3., a new style purple LED will be trialled in Dwarfs SST568 & SST574.

(03.03.2020) Cheltenham – Chelsea (SW 133/20, WN 9)

Diagram 11/20 (Cheltenham – Chelsea) replaced 25/11 account signalling changes in SW 585/19 & 97/20.

05.03.2020 **Somerton** **(TON 81/20, WN 10)**

On Thursday, 5.3., No 3 Road was booked out of service due to drainage and sleeper condition (No 4 Road remains booked out). Track Closure Devices have been provided at Dwarfs SOMV4 and SOMV6.

06.03.2020 **Cheltenham** **(SW 131/20, WN 9)**

On Friday, 6.3., Charman Rd was reopened to road traffic. The protection equipment was reinstated – boom barrier masts & arms 1 & 2, flashing light masts 3, 4, 5, & 6; and pedestrian gates 7, 8, 9, & 10.

07.03.2020 **Richmond Junction** **(SW 132/20, WN 9)**

On Saturday, 7.3., the point machine on Points 674D was replaced by an SPX MK3 point mechanism.

(10.03.2020) **South Geelong** **(SW 32/20, WN 10)**

Diagram 74/18 (South Geelong) replaced 50/16 due to the provision of an additional flashing light mast (SW 219/18).

11.03.2020 **Dimboola – Rainbow** **(SW 33/20, WN 11)**

On Wednesday, 11.3., an Absolute Occupation will be issued to cover the entire line between Dimboola and Rainbow SW 221/19 (which booked the line out) was cancelled.

17.03.2020 **Kilmore East** **(SW 37/20, WN 11)**

On Tuesday, 17.3., Crossover 22 was equipped with M23A dual control point machines. The hand throw levers are secured by Maintenance Padlocks with the keys held by the Signal Maintenance Technicians.

Indicators have been provided at Kilmore East for Crossovers 22 and 24. The light in these indicators will normally be extinguished, but will flash red when the points are placed in the hand operating mode.

Diagram 88/19 (Heathcote Junction – Kilmore East) replaced 22/19.

20.03.2020 **Pakenham East Train Depot** **(SW 130/20, SWP 4/20, WN 9)**

On Friday, 20.3., the signalling at the new Pakenham East Train Depot was commissioned. The depot consists of 10 stabling roads (each over 500 metres long and holding three 7 car HCMT sets); a Train Maintenance Facility (TMF), a Wheel Lathe, a Presentation road; a Bio wash and graffiti removal road; a Test Track; and an Integrated Test Facility (ITF).

Homes PKE760, PKE761, PKE762, PKE763, PKE764, & PKE765 were provided. Dwarfs PKE704, PKE706, PKE712, PKE716, PKE717, PKE719, PKE720, PKE721, PKE722, PKE723, PKE724, PKE725, PKE726, PKE727, PKE728, PKE729, PKE730, PKE731, PKE732, PKE733, PKE734, PKE735, PKE736, PKE737, PKE738, PKE739, PKE740, PKE752, PKE756, PKE766, PKE767, PKE770, PKE773, PKE774, PKE776, PKE777, PKE778, PKE779, PKE780, PKE781, PKE782, PKE783, PKE784, PKE785, PKE786, PKE787, PKE793, PKE797 & PKE821 were provided.

Points 604, 606, 616, 617, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 652, 660, 663, 664, 667, 670, 673, 674, 677, 679, 680, 681, 682, 683, 684, 685, 686, 687, 693, & 697 were provided. All point mechanisms are Unistar In-bearer mechanisms. Derails and crowders 637, 638, 656, 676, 678, & 689 were provided. All derails are operated by electro-hydraulic mechanisms.

All train detection will be via axle counters.

The speed limit within the depot is 15 km/h, except on the Test track when operating under test mode when a speed up to 60 km/h is allowed governed by the fixed signals.

Downer Rail are the accredited operator and the infrastructure manager of the depot and are responsible for all train operations, and track & signal infrastructure withing the depot. The interface boundary between Metro and Downer Rail is at Homes PHM759, PKM761, & PKM763. The signalling within the depot is operated by the Signaller, Dandenong Signal Control Centre under the direction of the Downer Rail Yard Master.

Diagram 5/19 (Pakenham East Depot) was issued.

A new Caulfield Group Operating Procedure No 21 (Pakenham East Train Depot) was issued.

20.03.2020 **Cheltenham** **(LXRA, SW 149/20, WN 11)**

At 2200 hours on Friday, 20.3., the station was closed to traffic for grade separation work. Park Road was closed to road traffic and the level crossing protection equipment was removed.

All level crossings and pedestrian crossings between Heather Grove (Southland - Cheltenham) and Warrigal Road (Mentone - Parkdale) were altered to operate under express mode.

20.03.2020 **Mentone** **(LXRA, SW 149/20, WN 11)**

At 2200 hours on Friday, 20.3., the station was closed to traffic for grade separation work

All level crossings and pedestrian crossings between Heather Grove (Southland) and Warrigal Road (Parkdale) were altered to operate under express mode.

22.03.2020 **North Geelong C** **(SW 44/20, WN 12)**

On Sunday, 22.3., Rail Security Gates CGL45 were brought into use. SW 214/19 is cancelled.

23.03.2020 **North Geelong C – North Shore** **(SW 39/20, WN 12)**

On Monday, 23.3., the controls on Up Home NGC64 were altered so that the signal can only show a proceed aspect for trains routed via the Melbourne Loop if Up Home GLG62 is at proceed. This enforces the requirement in Operating Procedure 58 (North Geelong C) Rule 6B.

(24.03.2020) **Flinders Street – North Melbourne (Northern Loop)** **(SW 181/20, WN 12)**

Signalling Diagram 7/20 (Flinders Street – North Melbourne (Northern Loop)) replaced Diagram 13/06 as in service.

(24.03.2020) **Southern Cross – North Melbourne** **(SW 181/20, WN 12)**

Signalling Diagram 9/20 (Southern Cross – North Melbourne Passenger Lines) replaced Diagram 33/18 as in service.

24.03.2020 **Epping – South Morang - CBTC Trackside Radio** **(WN 11)**

Communication Based Train Control (CBTC) equipment is being installed between Epping and South Morang. On Tuesday, 24.3., the Trackside Radio Assemblies (TRA) will be turned on. The TRAs include radio antennas which will be mounted on standalone masts, fence lines, and existing signal masts.

26.03.2020 **Birregurra** **(SW 40/20 & 50/20, WN 12 & 13)**

On Thursday, 26.3., boom barriers were provided at the passive crossing at Aireys Reserve Rd (136.638 km) on the Down side of Birregurra. Operation is by axle counters. Healthy state indicators, yellow whistle boards, and remote monitoring equipment was provided. Road/rail vehicles are not permitted to on or off track at Aireys Reserve Road as an axle counter reset keyswitch is not provided.

Amend Diagram 32/19 (Birregurra – Colac).

27.03.2020 **Colac** **(SW 41/20, WN 12)**

On Friday, 27.3., boom barriers were provided at the existing flashing lights at Deans Creek Road (155.850 km) on the Down side of Colac. Operation is by axle counters. Healthy state indicators, yellow whistle boards, and remote monitoring equipment was provided. On or off track of road rail vehicles is no longer permitted at Cants Rd (155.026 km)

Amend Diagram 32/19 (Birregurra – Colac).

27.03.2020 **Pirron Yallock** **(SW 42/20, WN 12)**

On Friday, 27.3., boom barriers were provided at the existing flashing lights at Swan Marsh - Stonyford Road (172.638 km). Operation is by axle counters. Healthy state indicators, yellow whistle boards, and remote monitoring equipment was provided.

Amend Diagram 32/19 (Birregurra – Colac).

27.03.2020 **Moreland** **(SW 137/20, WN 12)**

Between Friday, 27.3., and Monday 30.3., the former Moreland signal box was demolished.

27.03.2020 **Jewell – Merlynston** **(SW 137/20, WN 12)**

Between Friday, 27.2., and Monday, 30.3., the following alterations took place:

- The through signalling cables in the temporary CSR between Albion and Coburg were commissioned.
- The following high voltage (1,000V) cables will be decommissioned: 1C313F-3C331F; 1C331F-3C371F; and 1C372F-3C411F. Switch 3C572F was closed and its status was changed to 'automatic switch, normally closed, controlled, and indicated'.

27.03.2020 **Cheltenham** **(SW 180/20, WN 12)**

At 2000 hours, Friday, 27.3., Cheltenham signal box was permanently switched out. The Train Controller may authorise Drivers to pass signals at Stop in the event of the failure of the illuminated letter 'A'. Permission must be obtained from the Head of Network Safety if it is necessary for the signal box to be switched in for any purpose.

28.03.2020 **Garvoc** **(SW 43/20, WN 12)**

On Friday, 28.3., boom barriers were provided at the existing flashing lights at Station Road (232.266 km). Operation is by axle counters. Healthy state indicators, yellow whistle boards, and remote monitoring equipment was provided. A reset keyswitch was provided at Station Rd, but on or off tracking of road/rail vehicles will continue to be prohibited at Laang Rd (232.723 km)

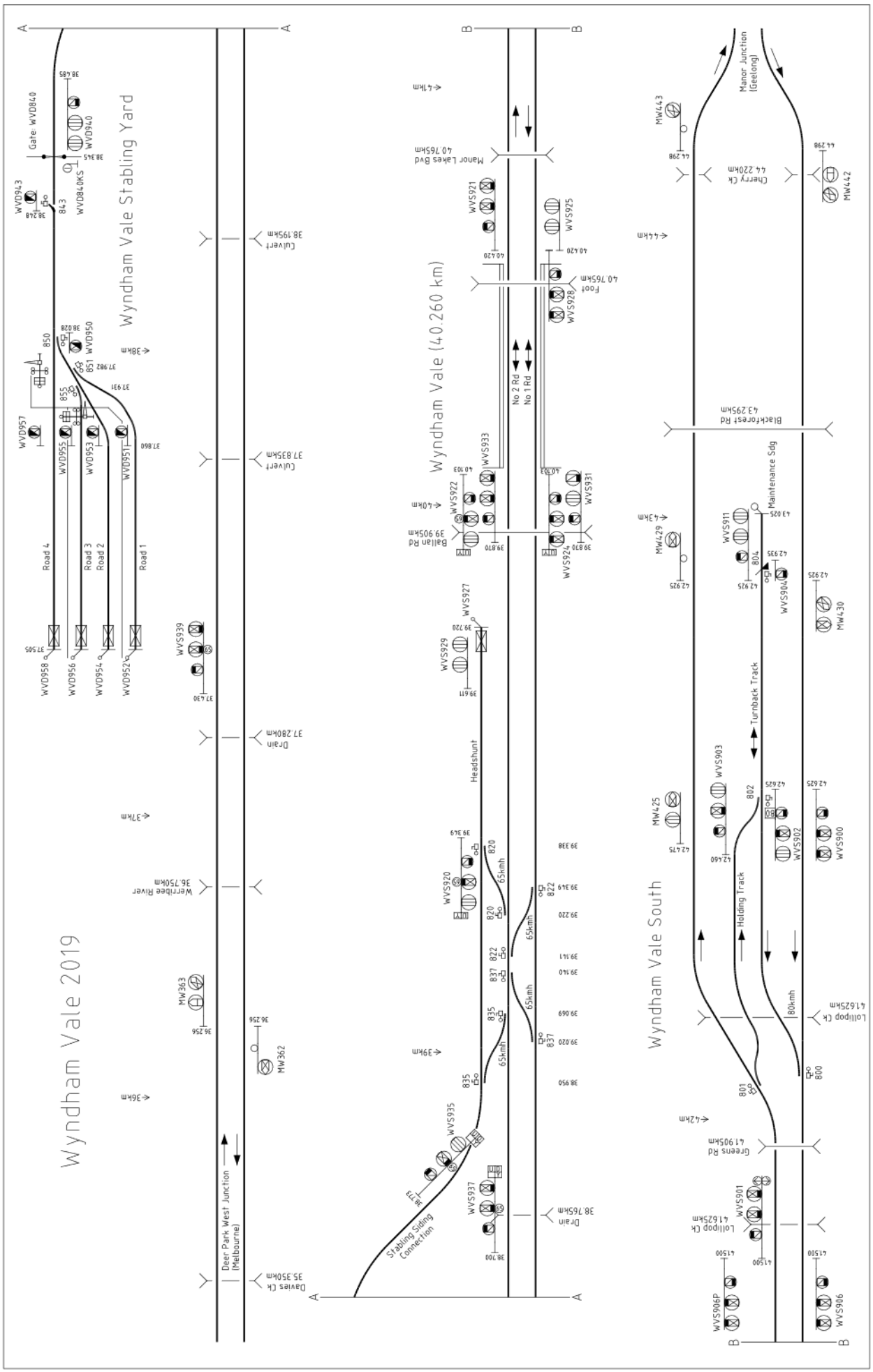
Amend Diagram 54/18 (Panmure – Sherwood Park).

31.03.2020 **Dimboola – Rainbow** **(SW 52/20, WN 13)**

On Tuesday, 31.3., the Dimboola – Rainbow Train Order Corridor and associated sidings have been booked back into service. The baulks at the Train Order boards at Dimboola have been removed.

The track to Rainbow is maintained at Class 4 standard, the section to 431.000 km is classified as Sidings, and the remainder of the line to Yaapeet is booked out.

SW 33/20 is cancelled.


Wyndham Vale 2019
Wyndham Vale Stabling Yard
Wyndham Vale (40.260 km)
Wyndham Vale South
Deer Park West Junction (Melbourne)
Davies Ck 35.350km
Werribee River 36.750km
Drain 37.280km
Culvert 37.835km
Culvert 38.195km
Gate WVD840
WVD840KS
WVD943
WVD957
WVD955
WVD953
WVD951
WVD958
WVD956
WVD954
WVD952
WVD950
WVS939
MW363
MW362
Road 4
Road 3
Road 2
Road 1
Strabbing Siding Connection
WVS935
WVS937
WVS920
WVS927
WVS929
WVS921
WVS925
WVS928
WVS933
WVS922
WVS931
WVS924
Manor Lakes Bvd 40.765km
Foot 40.765km
No 2 Rd
No 1 Rd
Ballan Rd 39.905km
Drain 38.765km
Headshunt
65kmh
80kmh
Manor Junction (Geelong)
Cherry Ck 44.220km
Blackforest Rd 43.295km
Maintenance Sdg
Turnback Track
Holding Track
Greens Rd 41.905km
Lollipop Ck 41.625km
MW443
MW442
MW429
MW430
MW425
WVS911
WVS904
WVS903
WVS902
WVS900
WVS901
WVS906
WVS906P

04.04.2020 **Metrol** **(SW 185/20 & 186/20, WN 13)**

On Saturday, 4.4., the interlocking software and TCMS data were upgraded to support the Toorak Rd grade separation.

05.04.2020 **South Kensington** **(SW 48/20, WN 13)**

On Sunday, 5.4., control of the signalling at South Kensington on the RRL Lines, West Tower Line, and Through Goods Lines was transferred from the RRL Signaller, Centrol, to the Melbourne Yard Signaller, Centrol.

The signalling between Spion Kop Junction and South Kensington for the Up RRL Line from Home SKN972 and the Down RRL to a point opposite Home SKN972 is operated by the Melbourne Yard signaller. Down Home SKN967 will be worked by the Melbourne Yard Signaller under the direction of the RRL Signaller.

05.04.2020 **Wyndham Vale** **(SW 48/20, WN 13)**

Between Tuesday, 31.3., and Sunday, 5.4., the Wyndham Vale Stabling yard was provided together with improved terminating facilities at Wyndham Vale. The Stabling Sidings are situated at the Melbourne end of Wyndham Vale and has four roads each of which is 346 metres clear. Down trains can now terminate in either platform and Up trains can originate in either platform.

The following signalling alterations took place:

- Down Automatic M363 can now display Medium Speed aspects.
- Down Automatic MW387 was abolished.
- Homes WVD940, WVS920, WVS922, WVS925, WVS927, WVS929, WVS931, WVS935, WVS937, & WVS939, were provided. All Homes are equipped with TPWS. Dwarfs WVD943, WVD950, WVD951, WVD953, WVD955, & WVD957 were provided. Automatic MW386 was provided.
- Automatics MW399, MW402, MW404, MW405, & MW414 (and co-acting MW414P) were redressed as Homes and renumbered WVS933, WVS924, WVS928, WVS921, & WVS906 (with co-acting WVS906P) respectively.
- Homes WVS920, WVS923, WVS935, & WVS937 are equipped with theatre indicators. The indicators display 'U' for the Up Line, 'D' for the Down Line, and 'Y' for the Stabling Siding Connection Line or Headshunt.
- Crossovers 820, 822, 835, & 837 were provided. Points 850, 851, & 855 were provided. Catch 843 was provided. All points are equipped with dual control point machines.
- Security Gates WVD840 were provided. Home WVD940 and Dwarf WVD943 are interlocked with the gates.
- All train detection is by axle counters.
- Friction buffer stops and fixed lights are provided at the dead end of each siding road and the headshunt.

All points and signals are worked by the RRL Corridor Signaller Zone 3, Centrol.

Diagram 80/19 (Wyndham Vale) replaced 126/14.

An access road is provided between Wyndham Vale Stabling Siding Roads 1 & 2 (Lockout Zone A) and between Siding Roads 3 & 4 (Lockout Zone B). To enter Lockout Zone A it is necessary to cross Lockout Zone B (i.e. across the neck of Roads 3 & 4. Boom barriers are provided at the entrances to Lockout Zone B (i.e. one at the entrance to the stabling yard, and the second at the boundary between Lockout Zones A & B).

A control panel is provided in the Yard Master's building with levers to control the two Lockout Zones and the two boom barriers.

The Lockout Zone levers are released by the Corridor Signaller. When the release is given and accepted by the Yard Master, the Signaller is prevented from signalling a rail movements into or out of the appropriate Lockout Zone. The Signaller will be able to operate individual points.

The boom levers control the two boom barriers. Boom 1 at the entrance to the yard can only be raised when Lockout Zone B has been locked out, and Boom 2 between Sidings 2 & 3) can only be raised when Lockout Zones A has been locked out. While the booms are raised, the relevant Lockout Zones cannot be returned to the Signaller.

(07.04.2020) **South Kensington** **(SW 58/20, WN 14)**

Operating Procedure 13 (South Kensington) was reissued due to the transfer of control to the Melbourne Yard Train Controller. SW 229/14 is cancelled.

(07.04.2020) **South Kensington – Footscray – Sunshine** **(SW 58/20, WN 14)**

Operating Procedure 13A (RRL Lines South Kensington – Footscray – Sunshine) was reissued due to the transfer of control of South Kensington to the Melbourne Yard Train Controller. SW 140/15 is cancelled.

(07.04.2020) **Deer Park West Junction – Manor Junction (SW 57/20, WN 14)**
Operating Procedure 55 (RRL Lines Deer Park – Manor Junction) was reissued due to the provision of the Wyndham Vale Stabling Sidings. SW 136/15 is cancelled.

(07.04.2020) **Birregurra – Sherwood Park (SW 54/20, WN 14)**
Diagrams 54/19 (Birregurra – Colac) and 6/20 (Panmure – Sherwood Park) replaced 32/19 & 54/18 respectively as in service.

(07.04.2020) **Birchip – Woomelang (SW 53/20, WN 14)**
Diagram 98/19 (Birchip – Woomelang) replaced 16/18 as in service.

11.04.2020 **Corio (SW 55/20, WN 14)**
Between Tuesday, 31.3., and Saturday, 11.4., the following alterations took place:

- Homes COR6 (63.954 km), COR38 (65.796 km), & COR42 (65.883 km) were renewed in situ.
- Home COR18 (63.953 km) was replaced by a new post located on the left hand side of the line opposite its former location.
- Home COR34 (65.883 km) was replaced by a tilt mast at the same location.

Amend Diagram 76/19 (Corio – North Shore).

11.04.2020 **Sunshine (SW 56/20, WN 14)**
On Saturday, 11.4., the S700 In Bearer point machines on Crossover 802 (11.487 km – 11.508 km) were replaced by M23A dual control point machines.

12.04.2020 **Sunshine (SW 56/20, WN 14)**
On Sunday, 12.4., the S700 In Bearer point machine on Points 833 (11.487km) & 830 (11.508 km) were replaced by M23A dual control point machines.

13.04.2020 **Epping – South Morang (SW 218/20, WN 15)**
Commencing Monday, 13.4., the system changeover switch will be operated each night to allow correspondence testing of the Rail Systems Alliance signalling equipment. This will transfer control of Points 053 & 054 at South Morang, and Signals EPP121, EPP126, EPP127, T742, T772, SMG153, SMG156, SMG158, SMG163, SMG164, & SMG168 to the ATS test control panel and interlocking.

13.04.2020 **Kooyong – Tooronga (SW 187/20, WN 13)**
On Monday, 13.4., the rail overpass at Toorak Road was brought into use. The level crossing was permanently abolished. The overpass is 265 metres long and the approach gradients are 1 in 33.

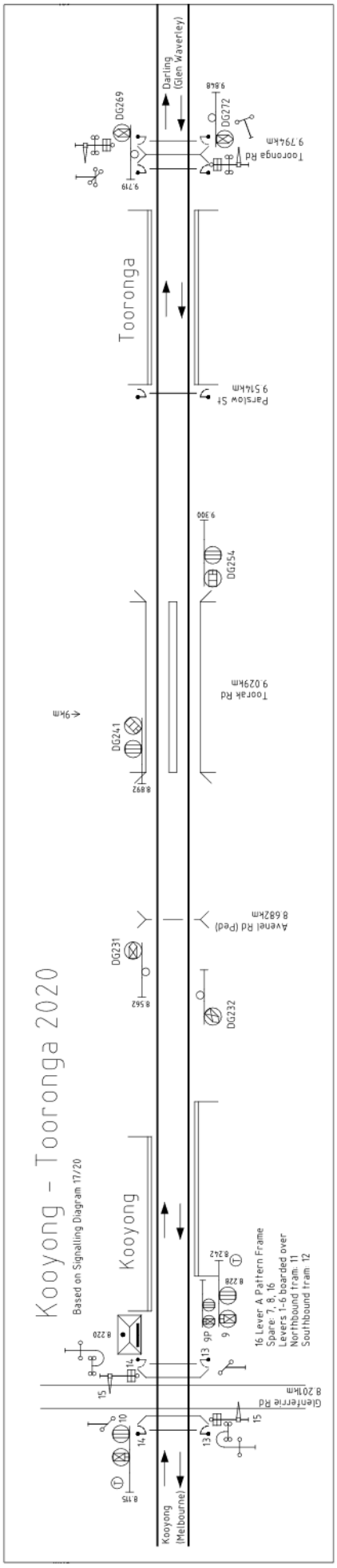
The level crossing protection equipment at Toorak Rd was abolished. Automatics DG243 and DG248 were abolished. Track circuits DG231T, DG243T, ADG243T, BDG243T, ADG248T, DG248T, & BDG272T were abolished.

Uncontrolled Homes DG241 and DG254 were provided. CSEE track circuits DG231T, DG241T, DG259T, DG254T, & DG260T were provided.

The Burnley Panel Signaller, Metrol, will be responsible for giving verbal permission to pass Homes DG241 and DG254 when at stop.

Diagram 17/20 (Heyington – Darling & Burnley Stabling Sidings) replaced 49/19.

End£



THE ORIGINS OF THE AUTOMATIC BLOCK SYSTEM

Andrew Waugh

The previous part of this series examined the rear end collision at Revere in 1871. In this section I will examine the state response to the accident, and the subsequent introduction of automatic block signals.

Charles Francis Adams, Jr and the Massachusetts Railroad Commission

In 1871 Massachusetts was unique in the United States in possessing formal government oversight over railroads. The Massachusetts Railroad Commission had been established two years earlier and had been modelled after the British Board of Trade. It had a wide ranging remit, including reporting on the financial status of the railroads in the state, rate disputes between shippers and railroads, and on accidents.

There were three Commissioners, but the active Commissioner was Charles Francis Adams, Jr. Adams had been born in May 1835 into an extremely well connected Boston family[1] – both his great grandfather (John Adams) and grandfather (John Quincy Adams) had been President of the United States. Charles graduated from Harvard in 1856, and was admitted to the bar in 1858. He served during the Civil War on the Union side, rising to the rank of Colonel by the end of the War. Ill by this time, he toured the United Kingdom and Europe with his new wife (his father, at the time, was the United States ambassador to the Court of St James).

Returning to the US in September 1866 he cast around for something to do. Notionally he recommenced a law career, but later admitted that he had no feeling for the law and never had a bona-fide client. He decided that railroads were the up and coming thing and determined to obtain a role with them. He commenced by writing articles for magazines, despite knowing nothing about railroads. Adams 'fixed [his] mind on the great probability' on Massachusetts establishing a body to regulate railroads and determined to try for a place on it. This seems a curious goal, as, at that time, there was no government regulation of railroads anywhere in the United States. Presumably, this idea was the consequence of inside knowledge and was undoubtedly helped by the return of his father from Europe in the spring of 1868.

In the spring of 1869, Massachusetts passed a law creating a Board of Railroad Commissioners, and in July 1869 Adams was appointed one of the three initial Commissioners. Despite being the most junior member, all accounts confirm that he was the dominant Commissioner. In his autobiography, Adams stated that the other two Commissioners were 'very ordinary men, both much older,' and that 'they let me do nearly all the work of the Board, and write all the reports, and that the reports were well thought of.' Around 1872 – notably after the Revere accident - the other two original Commissioners resigned and Adams became Chairman of the Commission, a post he retained until July 1879.

It is difficult to overstate the importance of Adams' work at the Commission. The Massachusetts Board was the first government regulator of railroads in the United States and it set the tone and approach of subsequent US regulation. In his review of American railroad accidents, Aldrich says "Adams was no enthusiast of regulation. An elitist, he had little sympathy for passengers killed through 'their own fault', and while he favoured state action to control train accidents, he believed that more might be accomplished by negotiations and public pressure than by laws and rules."[2] After the Interstate Commerce Commission – the Federal regulatory body – finally obtained powers to investigate accidents in 1910, Aldrich notes that "Adams's approach largely prevailed at the national level". As we shall see, negotiation and public pressure was exactly the approach used by Adams after Revere.

The recommendations of the Commission

Turning back to 1871, the legislation required all railroad accidents in Massachusetts to be reported to the Board who was to investigate them. The Revere accident was duly investigated and the report was published in the 1872 annual report.

To modern eyes, a curious omission from the report on the Revere accident was any consideration of the immediate causes. Adams, however, considered that it was not the Commission's task to apportion responsibility as to the accident; this was task of 'other public officials' (presumably the coroner and the district attorney). Instead, the Commission's responsibility was to enforce a penalty if the railroad had broken the law, and to highlight where any railroad regulation needed to be amended. Broadly, the conclusion of the Commissioners was that they "have seen no reason to suppose that the Revere disaster was occasioned, or in any way aggravated by the failure of the Eastern railroad to obey any law of the Commonwealth [of Massachusetts]. It only remained therefore to suggest the adoption of such precautions as would be likely to prevent the recurrence of any such disaster in future." In a sense this was the approach of the UK Board of Trade, with the difference that the focus was on the railroad company and underlying systematic issues, and that Adams was far better politically connected in Boston than any UK inspector ever was in London.

It is clear that Adams parleyed public concern about the accident into pressure on the railroad management to

[1] Most of the details on Charles Francis Adams' life are drawn from his autobiography: "Charles Francis Adams, 1835-1915", 1916, Houghton Mifflin Co, p168-76. https://archive.org/details/charlesfrancisad00adams

[2] Death Rode the Rails, American Railroad Accidents 1828-1965, Mark Aldrich, The John Hopkins University Press, 2006, p71.

improve their practices. For example, the report mentions, but does not detail, a list of safeguards that had been submitted by a 'citizen's committee' to the board of the Eastern Railroad after the accident, to which the board of the Eastern Railroad had complied. The report itself focussed on the what it considered the underlying systematic management or equipment issues of railroad accidents, dividing these up into issues that related specifically to the Eastern Railroad, and those which were common to all Massachusetts railroads.

The issues relating specifically to the Eastern Railroad management were:

- A want of discipline throughout the organisation resulting in rule failures and confusion in running the trains;
- The lack of equipment, particularly rolling stock, required to conduct the extra traffic safely;
- The lack of a siding at Everett Junction; and
- The lack of telegraphic communication on the Saugus branch line which caused serious delays when trains were delayed.

Having listed the deficiencies of the Eastern Railroad management, Adams then considered safety issues that were common to all Massachusetts railroads:

- A deficiency in the system of signals by which an interval of either space or time was insured between trains following each other.
- The want of a complete telegraph system which should keep the central office fully advised at all times of the exact position of each train on the road, and in communication with all of such trains at the several stations.
- To an insufficiency of brake power.
- To the use of tail-lights of insufficient penetrating power.

These issues discussed with members of the several 'citizens' committees' and a committee of railroad officials, and the following recommendations were agreed to with the railroad officials:

- A review of the rules under which the Massachusetts railroads were operated. As a result of this agreement, the Commissioners drafted a common rule-book, which was amended and approved by a committee of railroad officials. A common rulebook shared by different railroads was then unique in the US.
- The general adoption, at the earliest possible time consistent with a reasonable regard to the present condition of passenger rolling-stock, of continuous brakes. This resulted in the general adoption of the Westinghouse brake on passenger trains in Massachusetts by 1877.
- The construction of all new passenger cars in such a manner as to prevent telescoping in case of accident, and the change of existing cars in this respect within a reasonable time in the regular course of repairs. This resulted in the general adoption of the Miller platform on passenger cars in Massachusetts by 1878.
- Removal of sources of ignition in passenger cars – specifically the use of a safe method of car heating, and lighting[1].
- The substitution of Fresnel lanterns in place of the ordinary tail-lights now in use. This was specially insisted upon by the Commissioners and was finally agreed to by the railroads.
- The general adoption of a rule prescribing that a brakeman shall be stationed upon the last car of every train, whether freight or passenger, who shall be known as the 'signal brakeman,' and whose special duty it shall be to have charge of all train-signals, and to immediately provide for the safety of the rear of the train in case of danger.
- The general use of the telegraph in aid of the present time-table system. This recommendation will be further discussed in the next section.

Block working

One of the general issues that Adams identified was the lack of a system to ensure either an interval of space or time between two trains.

In his 'Notes on Railroad Accidents', Adams commented on the practices in 1871:

> The appliances for securing intervals between following trains [on Massachusetts railroads] were marked by a quaint simplicity. They were, indeed, "singularly primitive" as the railroad commissioners on subsequent occasion described them, when it appeared that on one of the principal roads of the state the interval between two closely following trains was signalled to the engineer of the second train by a station-master's holding up to him as he passed a number of fingers corresponding to the number of minutes since the first train had gone by. For the rest the examination revealed, as the nearest approach to the block system, a queer collection of dials, sand-glasses, green flags, colored lanterns and hand targets.

However, the topic of separating trains was the one on which it was not possible to come to a 'thoroughly satisfactory understanding' between the Commission and the railroads. Just as in the UK, public pressure could only go so far.

Adams (and the Commission) originally wanted the telegraph to be brought generally into use on the railroads, and all staff be thoroughly conversant with its use – including train running staff such as conductors. This was watered down by the railroads into the anodyne statement, given above, that the telegraph should be used in aid of the present time-table system (though the model rules developed by the Commission and agreed to by the railroads were based on train order working).

The Commission also originally specifically recommended that "Wherever, upon any road, trains are intended to run within ten minutes of each other, the

[1] Note that there was no mention of the car heaters causing the fire at Revere – this was an example where Adams was looking generally at unsafe practices in the investigation, not just those that were in evidence at Revere.

adoption of a system of telegraphic communication from station to station, enabling each train to be fully informed as to the condition of the track to the next station ahead. Or in lieu of a system of signals providing for intervals of space between following trains, a system which shall provide for a certain interval of time between such trains". The railroad officials however, responded with "Of questionable expediency. The committee deem the accompanying rules a sufficient provision for securing the object the Commissioners have in view." The committee specifically referred to Rules 37 & 121 of the draft, but these have no relevance to separating trains. It is thought that the committee was referring to an early draft, and the actual rules were probably:

> 20. A Regular Passenger Train following another Passenger Train of the same class, or a regular Freight Train following a Freight Train, must be kept no less than 10 minutes behind that which preceded it. An Accommodation may follow an Express Passenger Train in five minutes; but if running ahead of an Express Train, the Accommodation must keep fifteen minutes off the time of the Express, unless special orders shall otherwise direct.
>
> 21. Freight Trains must keep ten minutes out of the way of Passenger Trains which are to pass them.
>
> 23. Extra Passenger Trains must keep ten minutes out of the way of regular trains.

That Adams, however, was thinking in terms of block signalling was shown by the inclusion of two descriptions of block signalling in the 1872 report. The first described, in general, the operation of the UK block system. The second described the block system in use on the Camden & Amboy Railroad, the only railroad in the US that used this system[1]. It is notable, however, that Adams does not mention or consider automatic block signals.

The first automatic block signal installation

After the Revere accident, the Eastern Railroad had little choice but to improve its practices. The president of the railroad was replaced in February 1872 by Thorton K Lothrop. Charles F. Hatch was brought from the Lake Shore & Michigan Southern Railroad as the new General Manager. Hatch revised many of the operating practice on the road, including introducing Time Table and Train Order working.

One of the new methods introduced was the provision of automatic signalling on the double track line between Boston and Salem (18 miles) at a cost of $80,000. It is to be noted that Revere was on this section of track. This was the first automatic block signalling system in operational use anywhere and it was brought into use around the end of 1872[2][3]. It is not clear who took the decision to expend such a large amount of money on such an untested technology, however it is notable that President Lathrop lasted only two years in office due to his profligate expenditure[4].

Interestingly, while the installation was noted in the Commission's Report issued in January 1873 ("a most thorough system of electric signals to warn all trains of their proximity to each other had been put in use on the more crowded parts of the line"), the Commissioners were more interested in the adoption of the Westinghouse brake and the Miller platform by the railroads. This reflected the view of the Commissioners by 1873 that the greatest risk to passengers was due to derailment.

The automatic block system was installed by the Hall Signal Company and used Hall disk signals. Train detection was by treadles (called track instruments in the US). Further technical details will be given in the next part. The opportunity was taken to use the treadles and signals of this pioneering system for other purposes than just the automatic block system. The treadles were used to operate bells at level crossings, and approach bells at stations. The electric signals could be manually controlled to protect stations or junctions and detected the position of switches.

As would be expected, problems were found with this pioneering installation. In May 1874 it was disparagingly noted in a paper on block working: "This has hardly been in operation long enough to give any great value to any expression of opinion, but it has proved troublesome in winter, and the last summer regulations and time card contained no notice of it[5]" In August 1874 it was confirmed that the major problem was that the gravity batteries froze in Winter – this was solved by housing the batteries at central locations and distributing the power by wire. This was feasible as the Hall signals and treadle based track detection used very little power. Bradlee suggests that the Easter Railroad Superintendent of Telegraph "reconstructed and greatly improved" the signals.

In July 1875 the Railroad Gazette reported "Severe test on Eastern RR on the day of the Bunker Hill Centennial celebrations in Boston. On the special time card for that day there were 43 extras, beside the regular trains, and in addition a number of irregular extra trains were sent out and run entirely by telegraph. In all 100 trains were run over the section worked on Mr Hall's system, and there was

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[1] The block system was introduced into the US as a trial by Ashbel Welch, General President and Chief Engineer of the Camden & Amboy in 1863 after a rear end collision involving a special train returning soldiers from battle to New York and New England. In March 1865 the trial of the system became permanent. The Camden & Amboy subsequently merged with the New Jersey Railroad, and in 1867 the block system was extended to operate the entire main line between Philadelphia and New Jersey. In 1871 the line was leased to the Pennsylvania Railroad and the block system was adopted and extended by that company to Pittsburgh.

[2] The 4th Annual Report of the Board of Railroad Commissioners, issued in January 1873 mentions that a 'system of electric signals' has been put in use. An article in the Railroad Gazette, 9.5.1874, p173 stated that the signals had been in use for 'the last year'. The Railroad Gazette, 29.8.1874 p384, reprinted an article from The Boston Advertiser of 10.8.1874 which stated that the system had been in use 'for more than a year'.

[3] There were earlier trials of automatic block signals, some of which will be mentioned in subsequent parts, but the Eastern installation was the first permanent installation in operational use.

[4] Under Lathrop the Eastern's borrowings increased from $4.8 million in 1871 to $9.8 million in 1873, its capital in the same period hardly changing going from $4.2 million to $5 million. At $80,000, the cost of the automatic signals was small beer. Bradlee p89.

[5] Electric Railroad Signaling, Charles E. Smith, RRG, 9.5.74 p173. This article primarily described British style block signalling.

no trouble or delay whatever, the signals working very well."[1] By early February 1876 it was noted that the signals "work well enough" now the batteries had been placed where they do not freeze, although the installations had been unreliable due to the mechanism being "very delicate".

The Boston Advertiser described the new automatic system in October 1874. The reporter prophesised that automatic block signals "seems destined to play an important part in the future running of railways." The article started by identifying the benefits of an 'electric signal' – "Several of the greatest causes of railway accidents are removed by the employment of the electric signal. Head and rear collisions and accidents at grade crossings, switches and drawbridges, are rendered next to impossible." Sad experience was to show, unfortunately, that this claim was not completely true, but safety was certainly improved over the American Timetable and Train Order system. Perhaps more importantly for the adoption of the automatic block system, the paper goes on to state "A most important, and to many of our overcrowded railroads an inestimable advantage [in providing automatic signals], is that the capacity of the road may be increased to an enormous extent for it matters not how many trains there are on a road as long as they are safely kept a certain distance apart." This requires explanation. Roads working with the model Massachusetts standard rule book generally required trains to be kept ten minutes apart. This limited the capacity of the line to six trains an hour. If automatic signalling was provided with block sections of one mile, and the train speed was 25 mph, the minimum headway would be 2.4 minutes giving a capacity of 25 trains an hour – the equivalent of building another four tracks[2]. This benefit increased as train speeds increased. By February 1875 it was acknowledged that the manual block system would give the same safety improvement but "the principal objection to this plan is the great expense of employing so many men day and night, and the possibility of accident by carelessness or mistake."[3] Interestingly, it was also noted in February 1875 that "the objection that greater safety renders the engineer more negligent applies with equal force to any improvement of that kind, and is probably not valid, since he must constantly be on the watch for the signals."

More installations

Once the bugs had been worked out, other Boston based railways followed suit.

In October 1874 it was reported that the Boston & Lowell Railroad had signed a contract to equip their line from Boston to Stoneham Branch Junction (10 miles) with Halls' electric signals. In February 1875 it was confirmed that the system was being introduced on the Boston & Lowell Railroad, and arrangements had just been completed with the Old Colony Railroad[4] and the Boston & Albany Railroad to install the system on their lines. In early February 1876 the Boston & Albany brought into use an automatic block installation between Boston & South Framingham. At this time, it was also noted that the Lowell Railroad had Hall's automatic block signals out to "Woburn Watering Station" and they worked "well enough". The Boston & Albany had an "improved system" which worked better than the two earlier installations on the Eastern and Lowell Railroads. The Old Colony Road had installed automatic block working on 4 miles of road with no frills (no bells at stations etc) and "it works a charm".[5]

The introduction of track circuits

Around November 1878, the Fitchburg Railroad[6] installed a trial installation of a competing automatic block system by the Union Electric Signal Company[7]. This used the Robinson track circuit and clockwork disc signals. By June 1879 the system was in use over 10 miles of the Fitchburg track[8], and the installation at Watertown Junction was inspected by the Massachusetts Railroad Commissions and others. The signals were reported "to be reliable and do the work expected of them."[9]

In November 1879 the Railroad Gazette reprinted the chapter on electric signals from Charles Adam's book on Railroad Accidents. This resulted in an indignant letter from the Union Electric Signal Co who believed that it endorsed the Hall system over theirs. They pointed out that the use of track circuits made their system much safer, for if the current is broken the signal went to danger. They also noted a recent accident on the Eastern Railroad in which a train became divided and the leading portion released the block as it passed the next signal. Finally, they claimed that the Hall system had been installed on the approaches to the Grand Central Depot in New York "at heavy cost", but it had had to be removed and another substituted.[10]

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[1] Railroad Gazette 3.7.75 p279

[2] It took a long time before the capacity increases of automatic block working were accepted by US railroads. This was partially because many railroads did not use a 10 minute train separation – they operated freight trains at drag speeds on a visual separation ('smoke signals'). Operated in this way, the capacity of a line was far greater than might be at first apparent. It is no coincidence that block signals were first accepted on lines with a large amount of passenger traffic and when all train speeds began to increase towards the end of the century.

[3] Paper presented to the Society of Arts at the Massachusetts Institute of Technology on 'Hall's Automatic Electric Railway Signals' by Professor Pickering, and reprinted in The Railroad Gazette 13.2.75 p70

[4] This railroad served the area to the south of Boston

[5] Railroad Gazette 25.2.76 p89

[6] This railroad served the area to the west of Boston

[7] Technically, the Fitchburg trial was installed by Oscar Gassett on behalf of the proposed Union Electric Signal Co, as the company was not chartered until 28 December 1878.

[8] This seems to have been track miles on a double track line, i.e. 5 miles of route.

[9] Railroad Gazette 27.6.79 quoting a report in the Boston Advertiser of 23.6.79.

[10] Railroad Gazette 5.12.79 p643-4. The system installed on the approaches to Grand Central was a manual block system invented by David Rousseau – see The Railroad Gazette 13.2.80 p85

The Massachusetts Railroad Commissioners reviewed the state of the art in railroad signalling in their January 1880 report[1]. In beginning their commentary on automatic signals, they noted "that it is a requisite of any system that the normal condition of its signals should indicate danger, so that, in case of any derangement of apparatus, accidental or intentional, warning will be given. Thus failure to act will at most stop or check the movement of a train. It will never cause a disaster. A device that fails in this particular fails at the outset." While the principle was clear, they did not have a modern understanding of 'fail safe' as, of course, the Hall system was not failsafe. This was recognised by the Commissioners in their review of the system:

> The objections urged against Mr Hall's block or track and switch signals, apart from their cost, are mainly these:
>
> (1) It is said that they are so delicate and complicated that they often fail. This, to be sure, when the failure is of electric current, does not directly result in an accident. It only delays a train. Each double-track road has orders directing the time of delay on seeing the signal of danger: a time necessarily brief – say one minute – and after this the train proceeds "with caution." But the tendency of frequent false alarms is to reduce the amount of caution; and the cry of "wolf," too often repeated, may make it unavailing when danger really comes.
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> (2) It gives no warning of a broken rail, and does not profess to give such warning.
>
> (3) Neither does it give warning of a car left on the track by a passing train – an accident not unusual, especially with freight trains. On the contrary, in such a case, the engine, with the portion of a train attached to it, passing off from the obstructed section, sets the signal of safety and lures a coming train into danger by a false announcement. Something like this happened recently on one of our Massachusetts roads. An engine was sent after dark to take five cars from a siding, push them on the main track and then haul them away. There proved to be six cars, which were pushed from the siding, and when the five were hauled away, one uncoupled car remained on the main track. A passenger train afterward left the station and came in collision with this car. Fortunately, the result was not serious, but it illustrates a danger against which Mr Hall's signals do not profess to guard.
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> (4) So it is said that a train on a guarded section, followed by another train proceeding with caution, would, on passing off, set the signal of safety. The second train breaking down from some defect of wheel or like cause, would remain as an obstacle and possible cause of collision with a third train coming on the section with the assurance of a clear track given by the signal. This, however, could never occur unless the second train were allowed to enter a blocked section, nor without gross carelessness on the part of those in charge of that train in neglecting to flag the section.[2]

The Commissioners go on to say that these defects are avoided by the Union Electric signal. After noting that "the device is considerably cheaper than Mr Hall's, and it is claimed that, being simpler, it is less likely to be out of order," they go on to note that the breakage of a rail gives a danger signal ("provided the displacement of the portions of the rail is sufficient"), and that it indicates the presence of a car on the track irrespective of how it came to be there. On the other hand, "the invention has not been used nearly as much as Mr Hall's. Its proprietors, therefore, cannot refer to so many witnesses as to its working. Probably it is just to add that, for the same reason, there may have been fewer criticisms on its defects." Another advantage of the system noted by the Commissioners was its clockwork signals "Electricians are accustomed to say 'The less you ask of electricity the more sure you are to get what you want.' In the present state of science, this is no doubt true."

The Commissioners finished up by noting that the Fitchburg had had the signals on five miles of its road for more than a year, including the whole of the last winter. "Since May it has been in charge of the officials of its road, and their report is highly favourable."

To face this new competition, the Hall Railway Signal Co increased its capital to $175,000 in March 1880 to improve its manufacturing capabilities[3]. However, this marked a pivot from the treadle based train detection system marketed by Hall to the track circuit system marketed by the Union Switch & Signal Co[4]. It was to be a decade before the next Hall installation.

The next installation of the automatic block system must have particularly smarted for the Hall Co, as it involved the extension of automatic block signalling on the Eastern Railroad from Salem to North Beverly by the Union Electric Co. This was brought into use in December 1880.

The third track circuit installation appears to have been on the Providence & Worcester. A trial installation of the Union system was made in April 1882 over 6 miles between Providence and the 'Boston Switch' near Valley Falls. By this time the technology had improved sufficiently that reliability figures were reported. During September 1882, 3,175 trains passed through the trial section, each operating 20 block signals. This totalled 63,500 signal operations, and only 6 were stopped by any trouble with the mechanism or circuits – or 1 in 9,917 operations. One hundred and twenty trains were stopped by a train on the section ahead, or by a switch being in use, and one train was stopped by a signal

[1] Reported in the Railroad Gazette 13.2.80 p85 & 87

[2] This defect is a little unclear. Imagine three trains closely following each other. If the second arrives at a block signal before the first clears the section in advance, it will wait the necessary period of time and then pass the block signal at danger. When the first subsequently leaves the block section it will clear the block signal, leaving the second train unprotected. If the second train is then delayed in the section it is likely to be struck by the third, which would pass the block signal at clear. The Commissioners consider that in this case the second train should have been protected by a flagman.

[3] Railroad Gazette 19.3.80 p160

[4] The name of the Union Electric Signal Co was changed to the Union Switch & Signal Co on 13 April 1881 as part of the consolidation of that company and the Interlocking Switch & Signal Co under George Westinghouse.

caused by a broken rail[1]. In October 1882 the Union Company received a contract to equip the whole line. The cost of the signals was reported to be about $500 a block. By September 1884 the line was equipped throughout its entire length (44 miles) – the first railway line in the world to have its line completely protected by automatic block signals. At this time the railroad surveyed its 23 engineers (known, quaintly, at this time as "locomotive runners") on their opinions. The Railroad Gazette reported

> [It] is curious to note with what unanimity they bear testimony to the fact that they all "feel safer running over the road," that being the point apparently which has most impressed them, as is most natural. The replies are not strictly unanimous, for one man "don't think you can trust them," and "don't feel as safe as if there were more brakemen on the trains with a good man to flag"; but the general tone of all the remaining twenty-two is give in the following response: "They are the greatest possible help in running trains. The past winter in cases of dense fog and blinding snow-storms I have found them to be of the greatest possible aid, enabling me with perfect ease to avoid delay and run at the usual rate of speed, which I should not have felt safe to do before they were adopted. At night they are to the locomotive engine what the lighthouse is to the mariner, and in my opinion are indispensable." Another man says, "On one occasion I was brought to a stop by a broken rail when the only warning I received was an electric signal set at danger. Not only its benefits felt while running, but also in shifting and making up trains. Therefore, while I think it adds to the cares and duties of an engineer, by furnishing more points to be carefully watched, yet it creates a feeling of safety and security not otherwise obtainable." Another says: "I can see them at a greater distance than a man with a red flag, owing to their elevation, and they are more likely to be seen in time, because we look for them every day in the same place. I do not consider them perfect, but they come nearer to perfection than anything I have seen. In no case have I entered a block when occupied without the signal showing danger." On the other hand, several mention instances when the apparatus failed to work and showed a danger signal unnecessarily, and also several point out that they should not be implicitly relied on, but a flag put out in case of need as an extra precaution.[2]

By August 1883 it was noted that the Boston & Albany had installed automatic block signalling on more than 100 miles of road (probably 50 miles of actual line) and it was still being extended. These extensions appeared to be all Union Switch & Signal track circuits installations. The Boston & Albany also interlocked its Boston terminus in August 1883 using a S&F frame supplied by Union Switch & Signal. This was notable for the use of track circuits to hold the mechanical signals at danger[3].

In March 1884 it was reported that the Boston & Providence Company had contracted with the US&S Co to put up block signals from the Boston & Albany crossing in Boston to the junction with the Dedham Branch at Forest Hill, about 5 miles. It was planned to gradually extend the automatic block throughout the line[4].

Beyond Massachusetts

The first installation of automatic block signals outside Massachusetts appears to have been on the New York, West Shore & Buffalo Railway[5]. In 1884 the Union Switch & Signal Co installed a track circuit installation for 13 miles south of Cornwall, New York. It appears that this installation was in use, at least for testing, by June 1884. The railroad passed the West Point army base, which included an artillery range and The Railroad Gazette reported in June 1884 that "a wild shot was fired, however, a few days since, and a 400lb shot struck one of the 67 lb rails. The long angle fishplates broke, and the rail was force out in the middle into a U form. Danger signals were immediately set in both directions by electric apparatus, which, if a train had been approaching within a little distance, would doubtless have prevented a serious accident"[6]

Apart from being the first automatic block signal installation outside the State of Massachusetts, this installation was notable in other ways. It was the first to use semaphore signals instead of the earlier Hall or US&S disc signals, and it was the first to provide three aspect signalling with a distant signal mounted underneath every home signal[7]. As this marks a change in technology it forms a convenient place to break the story.

Before finishing, it is worth considering why the market swung so comprehensively to the Union (track circuit) system over the Hall (treadle) system from 1880.

In hindsight, of course, it is obvious that the track circuit system was better than a treadle system, and the comments of the Massachusetts Railroad Commissioners in 1880 show that these advantages were apparent even at that early date. However, this is not the whole story as a revised version of the Hall treadle system successfully competed with the Union track circuit system in the early 1890s – the treadle system was considered more reliable than the track circuit.

A major factor must have been the unfortunate death of Thomas S Hall on 1 December 1880, which appeared to remove the technical leadership from the Hall Co. In December 1883 the rights to use Hall's patents and manufacture the equipment had been assigned to the Wharton Railway Switch Company of New York, and the Hall Co became moribund until 1888 when Thomas Hall's two sons, Alvah and William revived the company[8].

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[1] Railroad Gazette 20.10.82 p653

[2] Railroad Gazette 19.9.84 p687

[3] Railroad Gazette 3.8.83 p505-6

[4] Railroad Gazette 28.3.84 p247

[5] This line ran from New Jersey to Buffalo along the western shore of the Hudson River in competition with the New York Central.

[6] Railroad Gazette 27.6.84 p487

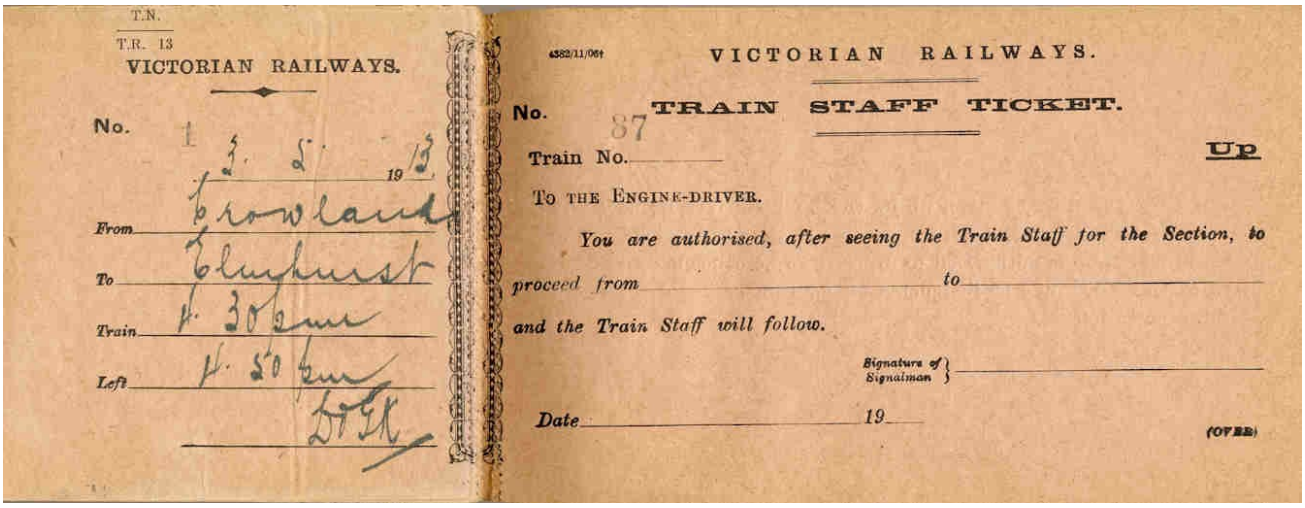
[7] Railroad Gazette 28.11.84 p846-7

[8] Railroad Gazette 21.12.83 p845. In 1889 the moribund Hall company was reconstructed by Thomas Hall's two sons: William and Alveh Hall. The banjo signal, and the circuits, were redesigned and the company had some success in selling its wire circuit

Matching the weakness of the Hall Co was the strength after mid 1881 of the Union Switch & Signal Co under George Westinghouse. Well capitalised, the US&S Co was a full service signalling contractor that supplied conventional mechanical interlocking (and subsequently power interlocking) as well as automatic block signalling. Commercially, this had a number of advantages for the US&S Co. It meant that the US&S Co became a larger company with a bigger business (particularly as US railroads started to install interlocking at key points). The interlocking side of the business meant that the company was not dependent on the small number of automatic block installations for its survival. And, finally, the US&S Co could install more complex installations that included both interlocking and automatic block signalling.

THE TRAVELS OF A STAFF TICKET BOOK

Chris Wurr



This is the short tale of the l-o-n-g travels of a 20th Century Train Staff Ticket book. Some years ago, an Up Train Staff Ticket book came into my possession courtesy of a friendly Block & Signal Inspector.

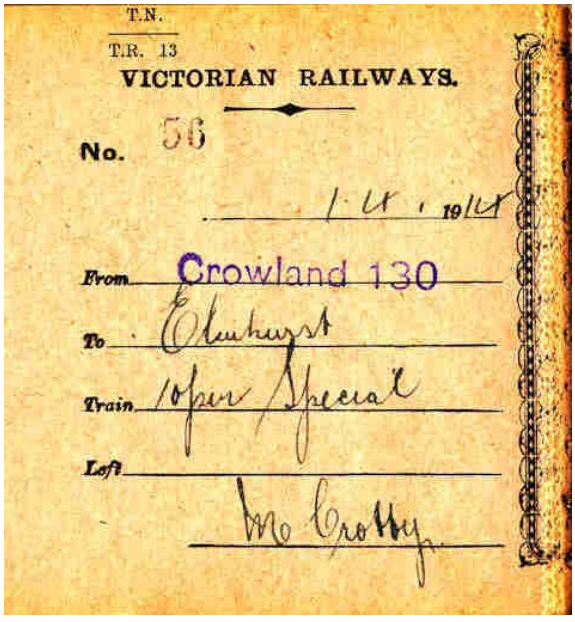
Opening the stout, classically ink-marbled cover to ticket number 1 reveals that it was issued on 3rd May 1913 for the 4.30pm train from Crowland to Elmhurst, and that that train left at 4.50pm.

But that cannot be? Crowland/s was the first station out on the Navarre branch line, so a Train Staff Ticket from there to Elmhurst, whilst it was surely an Up journey, would have involved a reversal of direction at the junction station. And besides, the Navarre line wasn't opened until 28th May 1914. So, what's going on here?

Ah ha! The junction station for the Navarre line was originally called Crowland/s. Its name being changed to Ben Nevis at the time construction began on the Navarre line. This was necessary, for the new branch line was to pass through the township of Crowlands, and of course that would be the name chosen for the station there.

A perusal of *Jungways* then reveals that the date of issue of ticket number 1 in this book, happens to be Day One of Crowland (later Ben Nevis) being created a Train Staff & Ticket station, working the sections either side to Elmhurst on the Up and Ararat on the Down.

My book remained in constant use at Crowland, from this date until the issue of ticket number 78 on 19th May 1914. The Ararat, Avoca, Maryborough line was a hive of activity over that 12 month period. Butts in the book show issues for trains at all hours of the day and night --- regular timetabled trains, livestock specials, goods specials and No.1 Up, a mixed, making regular appearances. Many of these trains were issued with a Master Key, indicating perhaps, a shunt at lonely old Eversley, this being noted in ink on the butt.



signals. In 1880, however, Alveh Hall was only 27 and William only 17.

The outbreak of WW1 was but four short months away, however finances still appeared to be good. On ticket number 55, issued on 1st April 1914 (no --- not an April Fool's Day joke) the practice of laboriously writing *Crowland* in pen and ink on each ticket and butt became a thing of the past. **Crowland 130** henceforth was rubber stamped in blue ink, on the *From* line.

Issuers of tickets included E. Lancaster, M. Crotty and M. Humphrey, who signed their names in full, but many others merely scribed their initials on the tickets and butts. One gentleman even opting for a simple "K".

And thus, life rolled on at bucolic Crowland ------ until ticket 78 had been issued for the 7am Up on 19th May 1914. Life was about to change there. Two days later on 21st May 1914, Crowland was renamed Ben Nevis, in preparation for the opening of the Navarre line (with its very own Crowlands) a week later on the 28th.

No doubt to avoid confusion of the old and new Crowland/s, my Train Staff Ticket book was withdrawn from the now named Ben Nevis. Gosh, the fancy, new *Crowland 130* rubber stamp didn't even see two months in service! To add insult to injury, and waste 2/6 of valuable VR revenue, the stamp couldn't even be re-cycled out to Crowlands on the branch! The station number 316 wasn't the same and despite the VR's previous spelling economy of chopping Ss or second names off stations all over the state, the new Crowlands, remained stoically possessive of its tail s, right until the line closed in February 1954.

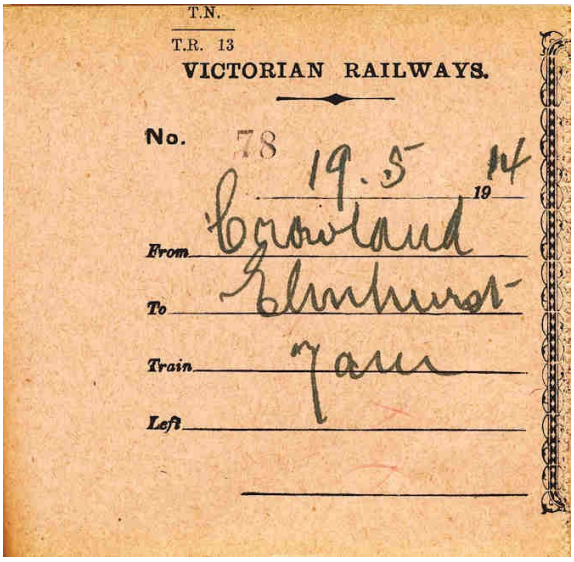
Having wasted the cost of a rubber stamp, the VR were determined not to waste the 121 perfectly good, blank tickets still left in my book (fortunately for we latter day signalling enthusiasts). And so ticket number 79 popped up 13 months later at the opposite end of the state. On 18th June 1915, it was used to despatch the 9am (on Master Key) from Gelliondale to Welshpool. A journey of 274¼ miles via Ararat, for my little book. Dates would suggest that it *broke journey* (probably at Head Office) for a year, along the way. After that single, solitary showing at Gelliondale, the book took the long, slow 410¼ mile trudge all the way again, to the opposite end of the state. Yanac!!!! This journey took 18 years. The very next ticket issued (No.80) was for No. 2 Up from Yanac to Jeparit on 10th January 1933.

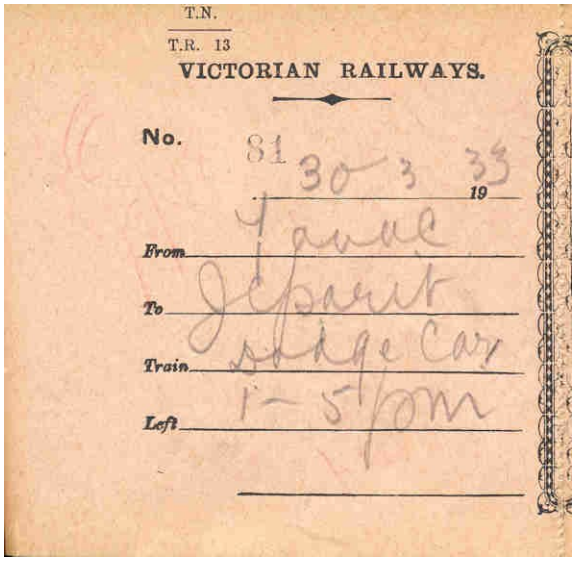
Ticket 81 was issued on 30th March 1933 for the 1.5pm Dodge Car back to Jeparit, then, following an 18 year languish in the drawer amongst Wimmera dust, silverfish and mouse droppings in the humpy at Yanac, my redoubtable little book was called upon for one final burst of importance. To get the 4.30am Goods on its way back to Jeparit on 5th September 1951. 4.30am ex Yanac? Yikes!!!!!!!

After a 38 year career roaming around rural Victoria, my book said enough was enough. No more! So the Ararat Block & Signal Inspectors over the years, rewarded my pink-paged book, with a long and quiet retirement in a locker or drawer somewhere in their office -- until the 1980s, when the little book came to the nurturing care of my *Twilight Home for All Things Once Important*.

Lamentably, not one of the railway locations mentioned in this narrative, now exists.

Not even Head Office – nor the Ararat Blocko's Office!


T.N.
T.R. 13
VICTORIAN RAILWAYS.
No. 78 19.5 14
19
From Crowland
To Elmhurst
Train Yanac
Left


T.N.
T.R. 13
VICTORIAN RAILWAYS.
No. 81 30 3 33
19
From Yanac
To Jeparit
Train Dodge Car
Left 1-5pm