The Times

March 2005

A journal of transport timetable history and analysis

How CPR defines scheduled railroading

Inside: What's in a name?..more on station names
Scheduled railroading returns to America
Holiday time on Adelaide's tramways and Victoria's railways

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The Times

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On the front cover

Despite operating through one of the most difficult railway operating terrains on the planet, Canadian Pacific has saved half a billion dollars– by adopting timetables! Illustration courtesy *Railway Age*. The Adelaide tram photos are from the camera of the well known Doug Colquhoun.

On page 15, David Hennell reviews a timetable of *Quarto* size, a term now vanished for thirty years. Timetables came in many sizes, and many subdivisions of sizes. Because of the way they were printed on very large sheets and then folded multiple times and cut, each subdivision was half the size of the other and the sequence went: *Broadsheet, Folio, Quarto, Octavo,....* Each *Broadsheet* came in at least a dozen size variations: *Royal, Foolscap, Crown* and *Demy* being among them. Strictly speaking, both components must be given to specify timetable page sizes, but often only one was used. What we used to know as just *Foolscap* (e.g. VR "S" notices) was usually *Foolscap Folio*. The MTT timetable reviewed here appears to be *Crown Quarto*, but this is dependent on what David set his photocopier at. Timetables are reproduced at varying scales in The Times due to production exigencies. The Americans and Japanese have far more variations on timetable paper sizes than did Europeans and we Australians. Everywhere of course, the system of cutting and folding prevails, but the romantic names have been replaced with faceless numbers, sizes are metric and variety is less. The Times is printed on A3, folded to A4 and mailed to you in a C4 envelope.

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What's in a name? Letters

Rather unsurprisingly, Ross Willson's recent article on replicated station names has produced responses and additions. Here **VICTOR ISAACS** *and* **ALBERT ISAACS** *throw in some more– and some different angles*

1. From Victor Isaacs

Ross Willson's list of duplicated metropolitan station names in the February *Times* is a good start, but it does not go far enough. There will be few, if any, timetable collectors whose interests are restricted only to metropolitan areas. I have therefore added names of all duplicated names in rural areas. I have also added duplicated names from New Zealand. Even within metropolitan areas, Ross missed some names, eg, Albert (Park), Albion (Park), Brunswick (St), Showgrounds.

In this list (page 4), the names of major cities come first (to follow Ross' list), followed by state in the case of rural duplicated names, then NZ. I have included a few names which vary very slightly, but are so similar they could easily be confused (eg Glanville/Granville), and names which were later changed (eg, Wangaratta, Queensland).

No doubt, there are more duplicated names that I have missed, so **additions are invited**. If the list included non-railway localities, it would be enormous (even including some duplications within the same states).

FOREIGN NAMES

May I now open another topic relating to station names in Australasia? Almost all Australasian names are either Aboriginal, Maori or named after places in Britain. Amazingly, there are very few place names derived from Ireland. Although there was a purge on German names in Australia during the Great War, there were very few which were station names, and even fewer named after places not people. German place names survived well in Victoria, where they include significant places. Some of the foreign place names commemorate battles Australian troops were involved in, either in WWI or WWII. This includes every one of the seven stations on Queensland's Amiens branch – which was built to open up a Soldier Settlement area. There are a few of Irish, Indian or American origin.

Here is my first list of Australasian railway stations of non-Aboriginal, non-Maori and non-British derivation. **Additions are invited.** I do not include names derived from people's names. Again, if this list included non-railway locations, it would be longer (but not by much).

A problem with a list of this sort is that political geography has changed since the names were adopted. Hence, in places named after Crimean War battles, I put both "Russian Empire" (then) and "Ukraine" (now). In the case of those named after World War One battles against the Turks (Queensland) and Biblical references (Tasmania), you can choose between Turkish Empire/Holy Land/Palestine/Israel.

2. From Albert Isaacs

Congratulations to Ross Willson for compiling his list of Metropolitan Stations with Common Names. This is an area that has always intrigued me but, unlike Ross, I never got around to actually compiling a list.

In your comments on the list, you say: "Was there any station name shared by 4 or more places?" Of course, Ross' list includes Abattoir/s which comes into that category. However, my list of Additions and Comments (below) also includes Showgrounds (Platform). I would argue that the names Showgrounds or Showgrounds Platform were used at at least six different sites in four Metropolitan areas. Adelaide has had three Showgrounds Platforms: at the original 19th Century Showgrounds site, east of Adelaide station; the former permanent platform serving the current site; and the temporary platform that is now used. If only Brisbane followed the conventions of other capital cities (fat chance!) and called their annual city/country bun-fight, the Show and not the Ecka, we'd probably have Showgrounds (Platform) at seven different sites in five metropolitan areas.

Here is my list of ADDITIONS AND COMMENTS:

- Add Albion: Melbourne, Brisbane

- Add General Motors/G.M.H.: Melbourne, Adelaide

- Add Showgrounds (Platform): Melbourne, Adelaide, Adelaide, Adelaide, Perth, Hobart

- It could be argued that Melbourne could be added to the list of Central"s. Although the name never appeared in T.T.s, many official sources used this name for the present Flinders Street, from the planning stage right through until the mid-1920s. The Victorian Railways Institute was probably the most consistent user of the name and a photo of the Flinders Street dome appeared on the front cover of their monthly magazine for about eight years with the caption: "Central Station, Melbourne". Oh, by the way, couldn't some people argue that this name is being used in Melbourne today, even though Melbourne Central is actually the name of the shopping centre on top of the railway station?

- I have no record of "Bellevue" in Hobart but would be fascinated to get some information.

- I would argue that "Killara" in Melbourne was not a suburban station. It did come under the aegis of the Metropolitan Superintendent and appeared (for railway convenience) in the Suburban W.T.T.s and Public T.T.s. However, in every other respect, Killara, and all other stations on the Lilydale-Warburton line, were operated as ountry stations - it most certainly had country fares and its tickets were country tickets

- Similar arguments could apply to Sydney's "North Richmond" on the Richmond-Kurrajong line

One of my favourite trivia questions centres around Sydney and Melbourne stations with common names. There's 14 such stations but only one of them is a 'spark'/E.M.U. terminus in both cities. Can you name it? The answer is in the postscript to this letter. [Answer next month– Ed]

I will watch with interest to see what other comments are made about Ross' original list. I'm also interested in any comments on my comments.

Abattoir(s)	Sydney, Brisbane, Adelaide, Hobart
(Mt) Aberdeen	NSW, Queensland
Adelaide (Lead) (River)	Adelaide, Victoria, NT
Albert (Park)	Melbourne, Brisbane, Adelaide, NSW
Albion (Park)	Melbourne, Brisbane, NSW
Albury	NSW, NZ SI
Armadale/Armidale	Melbourne, Perth, NSW
Ashburton	Melbourne, NZ SI
Ashfield	Sydney, Perth
Auburn	Sydney, Melbourne, SA
Avoca	Victoria, Tasmania, NZ SI
Balaclava/Balaklava	Melbourne, SA
Bayswater	Melbourne, Perth
Belfast	Victoria, NZ SI
Bell	NSW, Queensland
Belmont	Brisbane, Perth
Belgrave/Belgrove	Melbourne, NZ SI
Botanical Gardens	Melbourne, Hobart
Box Hill	Melbourne, NZ NI
Bridgewater	Adelaide, Hobart, Victoria
Brighton	Melbourne, Adelaide, Hobart
Broadmeadow(s)	Melbourne, Adelaide, Newcastle
Brunswick (St)(Jnc)	Melbourne, Brisbane, WA
Burwood	Sydney, Melbourne
Camberwell	Melbourne, NSW
Camden	Sydney, Adelaide
Canterbury	Sydney, Melbourne
(North) Carlton	Sydney, Melbourne
Caulfield/Corfield	Melbourne, Queensland
Central	Sydney, Melbourne, Brisbane
Cheltenham	Sydney, Melbourne, Adelaide
Claremont	Perth, Hobart
Clyde	Sydney, Melbourne, NZ SI
Coolac/Colac	NSW, Victoria, NZ SI
Craigieburn	Melbourne, NZ SI
Croydon (Rd)	Sydney, Melbourne, Queensland, NZ
Dimboola/Dimbulah	Victoria, Queensland
Domestic Airport/	Sydney, Brisbane
Donnybrook	Victoria, WA
East Richmond	Sydney, Melbourne
Eltham	Melbourne, NZ NI
Emerald	Victoria, Queensland
Emu (Plains)(Park)(Vale)	Sydney, Victoria, Queensland
Epping	Sydney, Melbourne, Tasmania
Fairfield	Sydney, Melbourne, Brisbane, NZ SI
Fish Creek	NSW, Victoria
Fitzroy	Melbourne, NZ NI
Flemington	Sydney, Melbourne
Frank(s)ton	Melbourne, NZ NI
Gisborne	Victoria, NZ NI
Gladstone	Queensland, SA
Granville/Glanville	Sydney, Adelaide
Glen Innes	NSW, NZ NI
Glenroy	Melbourne, NSW
Golf Links	Melbourne, Brisbane, Adelaide
Goodwood	Adelaide, Perth, NZ SI
Goulburn (Jnc)	NSW, Victoria
Gowrie (Jnc)	Melbourne, Queensland
Guildford	Perth, Victoria, Tasmania
Hamilton	Brisbane, Newcastle, Victoria, NZ NI
Hawthorn	Melbourne, Adelaide
Heathcote	Sydney, Victoria, NZ SI
Homebush	Sydney, Victoria
Hopetoun	Victoria, WA
Inglewood	Victoria, NZ NI
International Airport/	Sydney. Brisbane

Ivanhoe (Crossing)	Melbourne, NSW, WA
Kadina	Queensland, SA
Kew/Cue	Melbourne, WA, NZ SI
Kensington	Melbourne, NZ SI
Killara	Sydney, Melbourne
Kingston	Brisbane, SA, NZ SI
Laverton	Melbourne, WA
Lilyvale/Lilydale	Sydney, Melbourne
Linton	Victoria, NZ NI
Little River	Victoria, NZ SI
(South) Malvern	Melbourne, NZ SI
Maitland	NSW, NZ SI
Malvern(ton)	Melbourne, Queensland
Mangalore	Victoria, Tasmania
Maryborough	Victoria, Queensland
Menzies (Creek)(Ferry)	Victoria, WA, NZ SI
Mitcham	Melbourne, Adelaide, NZ SI
Mount Barker	WA, SA
Museum	Sydney, Melbourne
National Park	Sydney, Adelaide, Perth, NZ NI
Newmarket	Melbourne, Brisbane, NZ NI
Newtown	Sydney, Hobart, Victoria
North Richmond	Sydney, Melbourne
Ormond	Melbourne, NZ NI
Oxford (Park)	Brisbane, NZ SI
Penrose	NSW, NZ NI
Perth(ville)	Perth, NSW, Tasmania
Portland	NSW, Victoria, NZ NI
Queen's Park	Perth, Queensland
Red Hill/Redhill	Victoria, SA
Riversdale	Melbourne, NZ SI
Riverton	SA, NZ SI
Richmond (Road)	Sydney, Melbourne, Adelaide, Queensland, Tas, NZ SI(2)
Rookwood/Rokewood	Sydney, Victoria
Ross	Tasmania, NZ SI
St James	Sydney, Victoria
St Kilda	Melbourne, NZ SI
St Leonards	Sydney, Adelaide, NZ SI
Salisbury	Brisbane, Adelaide, Victoria
School (Lane)(Rd)	Victoria, NZ SI
Sheffield	Tasmania, NZ SI
Showgrounds	Melbourne, Perth
Somerton	Victoria, NZ SI
Springfield	NSW, NZ SI
Stratford	NSW, Victoria, NZ NI
St Marys	Sydney, Tasmania
(The) Summit	Queensland, SA, NZ NI
Sunshine	Melbourne, Brisbane
Swan (Hill)(View)	Victoria, WA
Sydenham	Sydney, Melbourne
Thornbury	Melbourne, NZ SI
Toongabbie	Sydney, Victoria
Tottenham	Melbourne, NSW
Trentham	Victoria, NZ NI
(Mt) Victoria (Park)(St)	Sydney, Melbourne, Perth, Queensland, WA
Wagga Wagga	NSW, WA
Wangaratta	Victoria, Queensland
Waterloo	WA, NZ NI
(Glen)(Mt) Waverley	Melbourne, NZ NI
Wedderburn	Victoria, NZ SI
Wellington	NSW, NZ NI
Welshpool	Perth, Victoria
Werribee	Melbourne, WA
Wilmington	Queensland, SA
Windermere	Victoria, NZ SI
Windsor	Sydney, Melbourne, Brisbane, NZ SI
Winton	Victoria, Queensland, NZ SI
Woodend	Victoria, NZ SI
Woodville	Adelaide, NZ NI
Wynyard	Sydney, Tasmania
(South) Yarra(ville)	Melbourne, NSW

Foreign names of Australian railway stations

NEW SOUTH WALES	
Bolivia	Bolivia
Engadine	Switzerland
Germantown (name changed during WWI)	Germany
Kentucky	USA
Kentucky South	USA
Moulamein (on Victorian line in Southern NSW)	Burma
Niagara Park	Canada / USA
Toronto	Canada
VICTORIA	
Alamein	Egypt
Altona	Germany
Antwerp	Belgium
Balaclava	Russian Empire / Ukraine
Belfast (former name)	Northern Ireland
Brunswick	Germany
Carlsruhe	Germany
Castlemaine	Ireland
Coburg	Germany
Donnybrook	Ireland
Heidelberg	Germany
Jolimont	Switzerland
Kilmore	Ireland
Kilmore East	Ireland
Lima	Peru
Mangalore	India
Maryborough	Ireland
Mentone	France
Westona	derived from West Altona Germany
QUEENSLAND	
Amiens	France
Antigua	West Indies
Bapaume	France
Bullecourt	France
Eidsvold	Denmark
El Arish	Turkish Empire/Holy Land/Palestine/Israel
Fleurbaix	France
Inkerman	Russian Empire / Ukraine
Jaffa	Turkish Empire/Holy Land/Palestine/Israel
Killarney	Ireland
Maryborough	Ireland
Maryborough West	Ireland
Messines	Belgium
Passchendaele	Belgium
Pozieres	France
Texas	USA
TASMANIA	
Bagdad	Iraq
Jericho	Turkish Empire/Holy Land/Palestine/Israel
Mangalore	India
Tiberias	Turkish Empire/Holy Land/Palestine/Israel
WESTERN AUSTRALIA	
Brunswick Junction	Germany
Denmark	Denmark
Waterloo	Belgium
SOUTH AUSTRALIA	
Cambrai	France
Sedan	France
NEW ZEALAND	
Belfast	Northern Ireland
Dannevirke	Denmark
Helvetia	Switzerland
Kandallah	India
Simla Crescent	India
Valetta	Malta
Waterloo	Belgium

Revolution in timetabling (2)- back to the future.

How returning to traditional timetabling methods saved Canadian Pacific half a billion dollars. **GEOFF LAMBERT** *collects some scattered information*

Early North American Railways, like early English railways, were loosely based on canal companies, and imagined that they would operate the same way– leasing out their tracks to anyone at anytime. Like the English companies, they very early on found out that this was not going to work. So—again like their English counterparts—they quickly adopted what we call today a "vertically integrated" structure. Thus, their early timetable efforts reflected this structure– all trains, including freight trains, were timetabled– even in the first known timetable– reputedly a hand-written one drawn up by a conductor on the Erie Railroad and produced in no more than 5 copies.

In North America, much more so than elsewhere, the timetable became the ultimate authority for the despatch of trains. With telegraphy in its infancy, trains on the vast American networks had a habit of disappearing from view. One could only ensure that they ran safely without cornfield meets if one made observation of the timetable mandatory. The timetable not only gave authority, it also ranked trains by "superiority"- one train might be superior to another because of its "class"- 1st-class trains were usually passenger trains, 3rd-class were usually freight. Direc-

14 **Express Train from BALTIMORE to WHEELING.**

STATIONS	M.	TIME.		
Camden Station,		5 00 A.M.		
Mt. Clare Junction,	2	5 13 "	P	Meet Accommodation East.
Washington Junc.	9	5 31 "		
Ellicott's Mills,	15	5 40 "		
Elysville,	20	5 58 "		
Woodstock,	25	6 10 "		
Marriottsville,	27	6 15 "	☞	[illegible]
Sykesville,	31	6 27 "		
Gaither's,	35	6 31 "		
Plane No. 1 W.S.	40	6 47 "		
Mount Airy,	43	6 55 "	P	Pass Frederick Accommodation Train, which will [illegible] Express West has passed.
Plane No. 4 [illegible]	45	7 01 "		
Monrovia,	50	7 11 "		
Ijamsville,	52	7 17 "		
Hartman's,	54	7 19 "		
Monocacy,	55	7 30 "		
Buckeystown,	62	7 35 "		
Point of Rocks,	69	7 52 "		
Berlin,	73	8 08 "		
Sandy Hook,	80	8 20 "	T	Meet Tonnage East.
Harper's Ferry, arr.	81	8 24 "	☞	Approaching carefully.
" " leave		8 27 "		
Duffield's,	87	8 42 "		
Kearneysville,	92	8 53 "		
Opequon,	95	9 04 "		
Martinsburg, arr.	100	9 05 "	☞	Should Express West be delayed, [illegible] Stock East and Tonnage West [illegible] See Special Notice No. 1, page 12.
" leave		9 23 "		
North Mountain,	107	9 37 "		
Hedges' Cut,	109	9 41 "		
Cherry Run,	112	9 47 "		
Sleepy Creek,	117	9 57 "		
Hancock,	122	10 07 "		
Sir John's Run, arr.	125	10 19 "		
" " leave		10 22 "		
Willett's Run,	133	10 32 "		
Rockwell's Run,	139	10 44 "	P	Meet Mail East. Mail East taking siding at West end.
No. 12 W. Sta. arr.	144	11 03 "	S S	Meet Stock East, and pass Stock West.
" " leave		11 08 "		
L. Cacapon Sid.	156	11 20 "		
Great Spring Run,	165	11 34 "		
Patterson's Creek,	170	11 51 "		
Cumberland, arrive	178	12 10 P.M.		
" leave		12 14 "		
Brady's Mill,	185	12 30 "		
Rawlings' W.S.	191	12 45 "		
Black Oak,	195	12 52 "	☞	If delayed, avoid Tonnage Trains from Piedmont after [illegible] P.M. See Rule No. 1, page 24.
New Creek,	201	1 07 "		
Piedmont, arrive	206	1 20 "	P	Meet Express East.

It will be observed, that except where it is otherwise stated, the time in the Tables is that at which the Trains may leave the several Stations—no obstructions existing to the contrary.

STATIONS.	M.	TIME.		
Piedmont, leave,	206	1 25 P.M.	P	Meet Express East.
Frankville,	214	1 51 "	T	Meet Tonnage East.
Swanton, arrive,	220	2 11 "		
" leave,		2 14 "		
Altamont,	223	2 23 "		
Oakland,	232	2 46 "		
Cranberry Summit,	242	3 11 "		
Rodemer's Tunnel,	245	3 22 "		
Rowlesburg, arr.	253	3 45 "		
" leave,		3 50 "		
Tunnelton,	260	4 12 "		
Newburg, arrive,	266	4 32 "	P	Meet Accommodation East. [illegible]
" leave,		4 33 "		
Thornton,	271	4 50 "		
Grafton, arrive,	279	5 05 "	S	Meet Stock Trains East, ☞ Avoiding them after 5 55 [illegible]
" leave,		5 20 "		
Fetterman,	281	5 25 "	T	Pass Tonnage Trains West
Valley Falls,	287	5 39 "		
Texas,	291	5 56 "		
Benton's Ferry, arr.	297	6 00 "		
" " leave,		6 07 "		
Fairmont,	302	6 19 "		
Farmington, arrive,	312	6 40 "		
" leave,				
Mannington, arrive,	319	7 00 "		
" leave,		7 [illegible] "		
Glover's Gap T.S.	328	7 17 "		
Burton, arrive,	330	7 27 "		
" leave,		7 31 "		
Littleton, arrive,	337	7 46 "		
" leave,		7 48 "		
Board Tree Tunnel,	340	7 56 "		
Belton,	345	8 10 "		
Cameron, arrive,	351	8 27 "	T	Meet Tonnage East.
" leave,		8 30 "		
Easton's Siding,	356	8 42 "		
Roseby's Rock Sid.,	362	8 57 "		
Moundsville, arrive,	368	9 12 "		
" leave,		9 14 "		
McMechen's Cut,	373	9 25 "		
Benwood, arrive,	375	9 30 "	P	Meet Mail East.
" " leave,		9 45 "		
Ritchie Town,	379	10 00 "		
Wheeling, arrive,	379	10 10 "	☞	Avoid Stock Trains East after [illegible]

It will be observed, that except where it is otherwise stated, the time in the Tables is that at which the Trains may leave the several Stations—no obstructions existing to the contrary.

This rather unusual early timetable– it showed each train on a separate page– was from the Baltimore and Ohio– America's first public railroad. It dates from 1858, a little after Train Orders began to supplement strict timetable working. We can see that "tonnage trains"- trains that do not depart at a fixed time but wait until they have a load—were already in existence.

tion also conferred superiority– eastward might be superior to westward. Inferior trains would have to wait at assigned turnouts for their meeting times with a "superior" train, even if the "superior" train were hours late. When an inferior train was delayed, it just had to wait for a spare “slot” in the plan before it could advance. Each timetable station page had the schedules for all regular trains operating over that portion of the railroad. In the case of scheduled meets, the number or symbol of the train that one train was scheduled to meet was included on the schedule, indicated in smaller, bolder print. This all created a degree of inflexibility which was a considerable impediment to efficient operation and it led, by the 1850s to new timetabling methods.

The telegraph was invented in the 1840s but, in the 1850s, it was used primarily to report train loads and reduce the waste of time and money spent in transferring loads. Trains were still running strictly by the timetable system. The first train official to realize the potential of the telegraph and demonstrate it in the safe running of trains was Charles Minot, superintendent of the New York & Erie Railroad. In the summer of 1851, Minot happened to be on an "inferior" train, which had been waiting for several minutes for the "superior" train to meet and pass. He became impatient and stepped into the commercial telegraph office at the station and wired the next station to stop the "superior" train when and if it arrived. His engineer refused to move the train, so Minot ran the train to the next station, where the procedure was repeated until the "superior" train was met several stations down the line. Within weeks, all Erie trains were controlled by the telegraphed orders of a train dispatcher.

Within a few years, most railroads adopted the practice of telegraphic train control and from this day forward, the traditional timetable began to change. Trains were now conveyed authority by right, class and direction, in that order. Right was conveyed by train order. The train order reigned supreme and superseded the timetable. Extra trains were non-scheduled movements and had no class and; they were given authority to operate by train order. Meets had to be scheduled between extra trains operating against each other and in most circumstances these meets also had to be set up by train order.

As the system and confidence in the safety of train orders grew, the proportion of trains with schedules in the timetables fell away. From the mid-nineteenth century to 1970, most railroads operated passenger trains, so there were always trains to appear in the company timetables. But, by the 1950s, these were often the only trains and well before that the timetables would often declare “*all freight trains run extra*”. In some quarters, these extra trains became known as tonnage trains– they would not move until sufficient car loads or tonnage had accumulated at their origin, to make them economically viable– that was the belief anyway.

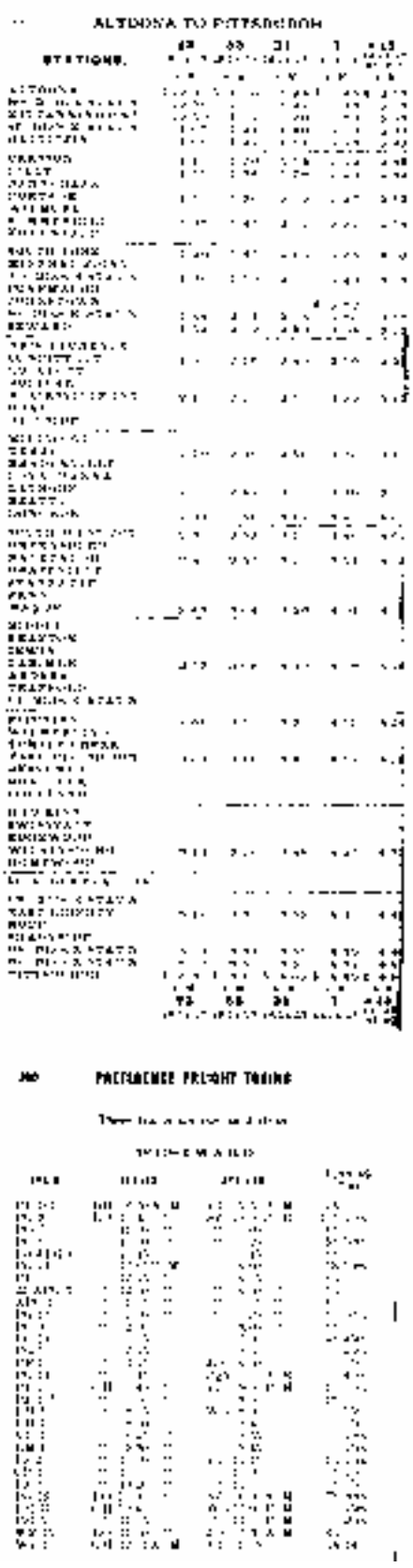
At right is a page from a Pennsylvania Rail Road timetable of 1914, showing a constant stream of trains ascending the famous Horseshoe Curve, just out of Altoona. All of these trains are First Class and most of them are overnight passenger trains. But in a small table that precedes the 20 west-bound schedule pages, another 30 trains appear. These are the “extra” trains (below right). Probably– we do not really know– another swag of “tonnage trains” threaded their way between all these– the railroad didn’t know until the morning whether any were to run.

Under the tonnage-based approach, the operating plan may list a train as operating every day, but if the railway cannot fill enough freight cars, it cancels or delays the train. In using this approach, CPR tried to minimize the total number of trains it operated by maximizing their size, which, in theory, minimizes crew costs and maximizes track capacity. However, tonnage-based train planning has serious drawbacks:

(1) The yards cannot fine-tune their operations and they require more freight cars and greater storage capacity to cope with the traffic variability.

(2) Demands for crew and locomotive resources may increase along with the costs for repositioning crews and equipment.

(3) Most important, customers suffer from unreliable service because the railroad gives train operation economics priority over customer

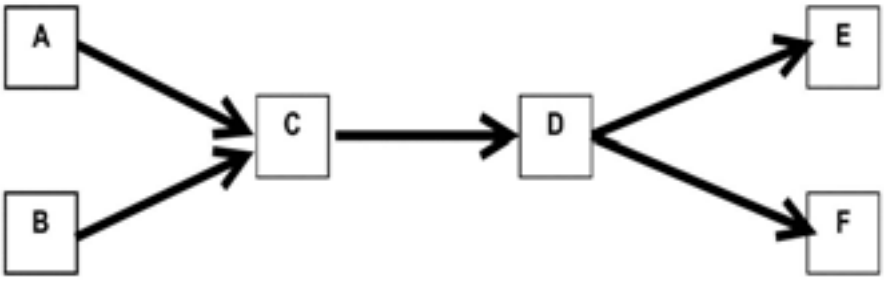


Scheduled and extra trains over the PRR’s famous Horseshoe Curve in 1914. Note that the Extras do in fact have an arrival and a departure time attached. The two-letter codes are for signal towers (cabins/boxes).

needs.

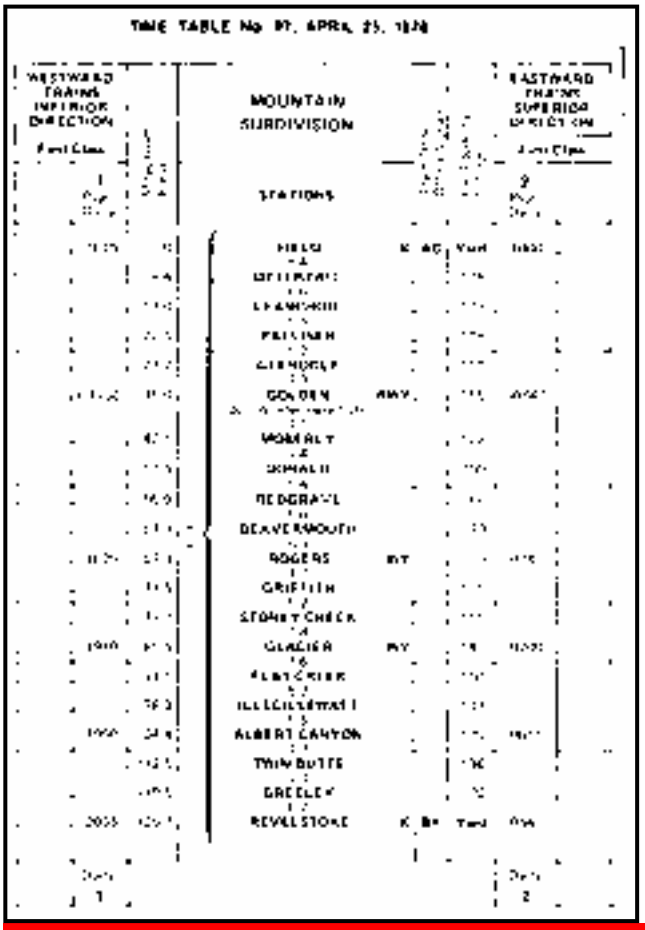
A most vexing problem of tonnage-despatching is the crewing problem. Nobody– least of all the train crews who are to work the trains– knows for sure that a train is to despatched until it is almost ready to go. This requires crews to "hang around" waiting for their trains, or to be "on call" at all sorts of odd hours. Returning to their home base is not easy, especially when disruptions occur.

Central to the tonnage-based approach to scheduling was the "blocking plan" routing cars across the network, through the rail yards, and on the trains. Blocking plans are made up of elements called blocks A block is a group of freight cars that move together for some portion of their journeys. For example, in a simple blocking plan, a block between A and C can carry traffic destined to all other locations. But a block from C to D can deliver traffic to D only for furtherance to E or F (right). Often a car is routed on multiple blocks over the network. The blocking plan defines the set of permissible blocks to use for car routing.



The alternative to the tonnage-based approach is the old, more disciplined, schedule-based approach. Scheduled railway strategies are gaining favour in North America as railways use new management science tools, particularly MultiRail, to craft cost-effective and customer-effective operating plans. Canadian Pacific (CPR), Norfolk Southern, and Canadian National have made the boldest moves in this direction.

Overall, CPR has 6,000 customers shipping via 20,000 distinct origin-destination pairs. Every day CPR receives approximately 7,000 new shipments from its customers. It must route and move these shipments safely and efficiently over its 14,000-mile network. It must coordinate the shipments with its operational plans for 1,600 locomotives, 65,000 freight cars, and over 5,000 train crew members and take into account the connections with other railways. These connections account for 40% of CPR's business.


TIME TABLE No. 87, APRIL 25, 1926

WESTWARD TRAINS INFERIOR DIRECTION

MOUNTAIN SUBDIVISION

EASTWARD TRAINS SUPERIOR DIRECTION

STATIONS

FIELD
GOLDEN
MORLEY
BEDGRAVE
BEAVERMOUTH
ROGERS
GRIFFITH
STONEY CREEK
GLACIER
ALBERT CANYON
THIN BUTTE
GRELEY
REVELSTOKE

CPR's customers want it to transport carloads, but CPR needs to move entire trainloads. For example, on an average day, of the 650 cars customers release to go to Chicago, only 45 of those cars are to move from the entire province of Alberta to Chicago proper. The railway must aggregate these low volumes of traffic in its operating plan.

The old way on CPR. Here, on one of its busiest stretches in the heart of the Rockies and at the mouth of the famous spiral tunnels at Field, only one train a day appears in the timetable

In the mid-'90s, CPR was struggling with high costs, low profitability, and rising customer-service requirements. CPR thought its traditional operating strategies would not be adequate for dealing with these issues. To meet rising customer expectations and to make a return on capital investment, CPR decided to make a wholesale change in its operating philosophy.

In 1997, CPR began exploring the concept of running a scheduled railway, and it was one of the first railways to (re-)adopt a true schedule that allowed it to adjust quickly to changing traffic demands. The schedule-based approach forces trains to run on time, as scheduled, even if they travel with light loads. Until recently, the railway industry shunned scheduled strategies for several reasons:

(1) They require operating trains with low tonnage when customer demand is below expectations.

(2) They depend on railways' systematically forecasting traffic levels by the day of the week, and quickly adjusting the plan.

(3) They require a granular, actionable understanding of each customer's requirements in each corridor.

(4) The needed schedule-based models require sophisticated operations research software to conduct comprehensive and timely analyses of different alternatives.

However, a well-crafted operating plan for a scheduled railway can actually lead to increased train sizes. Train size becomes a design criterion, and as long as the railway refines its operating plan as traffic patterns change, it will continue to operate large trains.

To address some of these issues, CPR turned to MultiModal Applied Systems and its MultiRail© software. MultiRail was first employed by the Saint Lawrence and Hudson division of CPR in 1995 and 1996,

which encompassed most of the eastern operations of the railway. This division was able to produce dramatic improvements in its costs and service levels through the careful crafting of a new operating plan using MultiRail, A joint team of CPR and MultiModal employees was formed in 1997 to explore the creation of a new operating strategy for CPR. The team implemented a scheduled railway in late 1999. CPR calls the resulting plan the Integrated Operating Plan (IOP).

CPR had to change its operations and culture, integrate its capital investments, and improve its financial performance and customer service. This required a massive paradigm shift for the operations team. The objectives included faster freight car velocity, improved locomotive utilization, reduced train starts, and improved customer service

The Integrated Operating Plan

A railway operating plan describes how freight cars should move (the car routings and train plan) and often includes the major assets needed to move the freight cars (such as train crews, locomotives, yards, and tracks). The IOP was designed to improve service and to reduce the number of trains, which are often competing goals.

CPR builds the train plan on top of the blocking plan. The railway aggregates these blocks into trains to move as a single unit. The train designer wants to maximize train size, reduce the complexity of the blocking on the train, eliminate work at intermediate yards, calculate running times between yards, determine block connections, and minimize consumption of fuel.

How train movements are scheduled affects block connection times between trains at CPR's yards and, hence, transit times for customers. Spacing the train arrivals and departures at the yards and terminals affects the efficient use of yard resources.

A group of experienced CPR service designers creates the operating plans with technical support from MultiModal. Input on the plan design is gathered from a variety of other groups, including both marketing and field operations. Marketing's focus is on the satisfaction of customer service requirements, while field operations focuses on the ability to execute the plan.

In any month, freight cars can take over 10,000 different potential paths, each unique origin-destination combination including a wide variety of traffic types. By refining the blocking plan, CPR can improve its profitability and operations in the following ways:

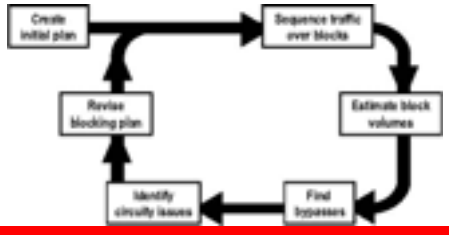
(1) It can cut shipment transit times by reducing switching of freight cars. Handling and holding freight cars in yards often represents over 50 percent of the total transit time.

(2) It can use the time saved by reducing handlings to slow train speeds to reduce fuel consumption, while still maintaining promised transit times. CPR reduced its fuel consumption by 16 percent to 1.25 US gallons per 1,000 gross ton-miles, making it among the best in the industry despite CPR's moving much of its traffic over the Rocky Mountains.

(3) It can balance workloads among yards. By making seasonal adjustments to the blocking plan, CPR can increase the capacity of the system by moving processing demand from yards near their freight car processing limit to yards with available capacity.

(4) It can reduce freight car dwell time in yards by rerouting cars to build large enough departing volumes to support more than one departing train per day between processing yards. Increased departure frequencies reduce waiting time in yards, further reducing overall transit times and improving reliability. CPR's freight car velocity at 160 miles per day is among the highest in the industry and has improved by 41.6 percent.

The problem of designing a railway operating plan is to satisfy a set of customer requirements expressed in terms of origin-destination traffic movements, using a blocking plan and a train plan. Thus, the primary variables are the blocks and trains. The constraints are the capacities of the lines and yards, the customer-service requirements, and the availability of various assets, such as crews and locomotives. The objective function in an abstract sense is to maximize profits. However, because of the complex nature of the problem, CPR focused on various cost metrics, such as car-miles, ton-miles, trains operated, and cars switched between blocks.



CPR and MultiModal decomposed the problem into a series of subproblems that are solved sequentially in five steps:

(1) Develop a traffic forecast reflecting each market segment's requirements.

(2) Use these requirements to design the blocking plan.

(3) Design trains based on the blocking plan.

(4) Use simulation to analyze yard and train workloads by the day of week and time of day.

(5) Pass the train schedule on to the planning tools that develop the crew and locomotive cycle plans.

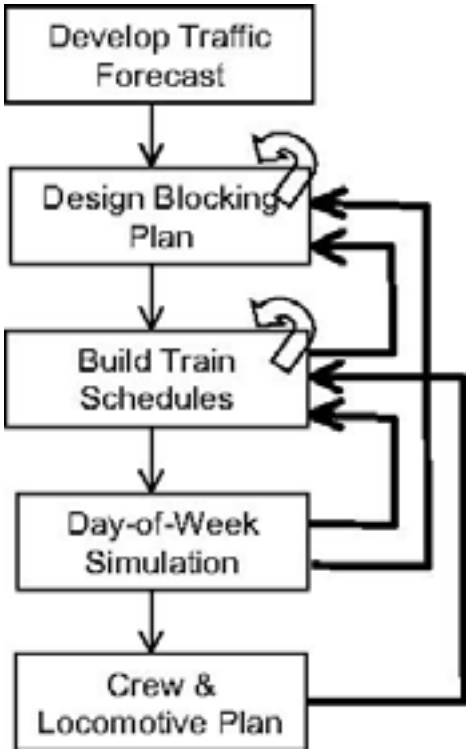
This 5-step process is performed in an iterative fashion, both within each step and between steps (below, p10). Each iteration adjusts the blocks and trains to improve the overall use of yard and train capacity and to improve the routing of the cars. Then customer-service standards are verified for compliance during the simulation step and changes made in the plan when it doesn't meet these standards.

Developing the Blocking Plan

The blocking plan is the foundation for the operating plan, determining the car routings, yard workloads, and contributing to customer service.

CPR designs the blocking plan in an iterative, MultiRail-based process (below). It begins by creating an initial plan and then evaluating the plan and identify potential improvements and test them. The initial plan can be either the one currently used or one algorithmically generated.

Starting with this initial plan and the traffic data, CPR uses an algorithm to generate a block sequence for each traffic movement. It then uses these sequences to estimate the expected block volumes and yard workloads and to identify possible improvements. Generally CPR measures a plan's quality in terms of the number of cars switched and total car-miles, subject to the ca-



pacity of the yards. Because there are many trade-offs among the improvement opportunities and many constraints that cannot be captured in the computer model, a service-design expert reviews changes to the blocking plan. The process of designing the blocking plan is highly iterative once planners create the initial plan. The traffic-sequencing process drives the evaluation process, with the experts in service design acting as gatekeepers determining which changes to include in each iteration.

MultiModal's block-sequencing algorithm is critical to its effective use and to the overall planning process. To execute the iterative process for designing blocking plans, CPR must make rapid, large-scale changes to the blocking plan.

Train Plan

The blocking plan lays the foundation for the train plan. Each train's schedule lists departure and arrival times, the blocks of cars it picks up or sets out at each location, crew change points, and locomotive requirements, among other details.

To develop a train plan, CPR uses MultiRail's heuristic algorithms to identify large-volume blocks and to create trains around those blocks. The train size might be smaller than capacity, so CPR uses MultiRail to identify other blocks that can be picked up en route until it estimates the train size is close to capacity.

Next, CPR uses MultiRail to re-estimate the train sizes and refine the day-of-week frequency to further improve capacity utilization. MultiRail's algorithms can accurately calculate the intermediate arrival and departure times of the trains as they travel across the network, but the planner needs to establish the original departure time for each train. Given the departure times, MultiRail employs several algorithms and reports to show the effects of the train plan on connection times and inventory of cars in the yards. The planner uses these calculations to adjust the train times and sometimes the day-of-week frequency to properly balance yard workloads.

Finally, the planner determines crew and locomotive requirements based on the train plan. These requirements are used in subsequent planning steps to develop specific deployment plans for locomotives and crews.

What are the characteristics of a good train plan? From a high-level view, a train plan must provide frequent service to meet customers' needs but contain a minimum of trains to reduce costs. A train should be fast to maximize track capacity and improve service, but slow to save fuel. A good train plan must not overburden yards by sending too many trains through them at once. Yet, bunching trains may reduce the connection times of cars at the yards. The train planners must resolve these somewhat contradictory design criteria. MultiRail provides rapid, interactive feedback on all of these criteria, allowing the planners to focus on perfecting the plans.

Day-of-Week Simulation

To speed the design process, CPR uses average-day analysis in the initial block-and train-plan development work. To do this, CPR uses Multi-Rail's SuperSim tool. SuperSim calculates the detailed trip plan or itinerary of each origin-destination movement, including the blocks and trains used and the yards where the cars are switched. CPR must typically generate 500,000 to one million trip plans. This simulation can be a bottleneck, inhibiting rapid and thorough analysis. However, in SuperSim, CPR uses a variety of techniques to speed this process so that it can obtain a solution in a few minutes, rather than in hours or days. CPR uses these results to fine-tune the operating plan by:

—smoothing workloads at yards,

—making schedule adjustments to improve car connections,

—changing the days trains operate to account for ebbs and flows in car volumes, and

—ensuring that the plan meets customer-service requirements.

The last major step in the planning process is developing a locomotive cycle plan. MultiRail estimates the tonnage for each train, which an internal CPR system uses to assign minimum locomotive requirements. These requirements result in an imbalanced, and therefore infeasible, locomotive cycle plan. CPR's locomotive-planning system devises a feasible plan by deadheading locomotives on existing trains to achieve balance. The algorithm employs a time-space network covering four weeks of train events over the railway's 250-yard network and uses a depth-first search technique to identify deadhead opportunities.

Results and Conclusions

One year after the 1999 implementation, CPR performed an audit of the benefits, which showed that scheduled operations reduced CPR's cost base by $300 million. Since the audit, CPR has analyzed two of its larger expense categories: crew wages and fuel. This analysis showed that an additional $210-million savings was attributable to the change in operating practices in 2001 and 2002. Total documented cost savings through the end of 2002 have exceeded half a billion dollars.

The new strategies for routing freight cars increase train weights and thus decrease train starts, enabling CPR to reduce its workforce by 18.8 percent despite an increase in gross-ton-miles of 13.8 percent. These efforts have resulted in an increase in carload train size of over 10 percent. More reliable train schedules facilitate scheduling time for track maintenance and reducing variance in the system and non-productive time. Aggressive yard bypass blocking reduces freight car processing in yards, which effectively increases

yard capacity and reduces yard crew wages and yard fuel consumed. Reduced horsepower per ton ratios on trains combined with selective speed reductions enabled by increased car velocity makes the reduction in transit times transparent to customers. CPR has also improved fuel consumption by introducing AC powered locomotives.

Aggressive block bypassing and improved connections between trains at yards reduces dwell time in yards, improving freight car velocity. CPR's freight car velocity increased from 113 miles per day in 1998 to 160 miles per day in 2002 (41 percent). CPR has reduced the fleet it owns or leases from 51,900 in 1998 to 44,300 in 2002 (15 percent) while gross ton miles increased 14 percent. In addition to ownership costs, car fleet size also drives maintenance expense.

CPR has improved the reliability of its service and its ability to shift resources quickly to meet customers' needs. It has made these gains while building an outstanding record as the safest major railway in North America for train handling. CPR has been recognized by many customers and shipping organizations for its service excellence and safe product handling, including General Motors, Sears, Shell Oil, Toyota, and Daimler Chrysler.

The methods CPR and Multimodal developed are portable to other railways. The success of CPR's approach to operations planning has captured the attention of railroads in the US, Mexico, Europe, and Brazil. At least two other major North American railways have begun using similar approaches and tool sets to improve their own operating plans.

So—has all of this resulted in train schedules re-appearing in CPR's paper timetables? Well, it appears the answer is "no"- but at least, somewhere in the system, schedule trains exist again. Unfortunately, lack of space has prevented us from chasing up this intriguing enigma.

And what of crew scheduling and rostering, has that improved as well?

Writing in *Trains* magazine in January 2005, Editor Mark Hemphill said, "Readers have acquired the impression that the industry's move toward scheduled railroading means that train crews will be able to go to work and go home at the same time every day. Unfortunately, no. The "schedule" in "scheduled freight railroading" is not the same sort of schedule that passenger trains have.

"Freight schedules have built-in cushions that will allow most of the ordinary things that will go wrong, to go wrong, and still allow a shipment to arrive on the promised day, without incurring huge costs that shippers can't or won't pay. For sake of a generalization, consider a "scheduled railroad" to mean that a freight train will arrive and depart each terminal it touches within the same four-hour window every time it runs.

"However, train crews have a 12-hour on-duty limit by federal law, in order to reduce fatigue-caused wrecks and derailments. The moment they report for duty, their clock starts ticking, whether their train is ready to go or four hours away. Because many crew districts require 9 to 11 hours to cover it one way — or four or five hours and crews double back home on another train — scheduling the train crew and train only works on railroads with a lot of trains, or with very few trains, and only to a point.

"The disconnect between scheduled railroading and scheduled crews grows exponentially each time a train changes crews. Suppose we operate a train 2,200 miles from Chicago to Los Angeles that requires seven crew changes en route. From experience, we know that when everything goes well, a new crew will swing aboard once every nine hours. That's only an average speed of 30.6 mph, but there are stops for inspections, refuelling, meets on single track, and some slow running in the mountains. We write a schedule that calls for the train to leave Chicago at 0001 hours, the second crew to report to work at the second terminal at 0900, the third crew at the third terminal at 1800, the fourth crew at the fourth terminal at 0300 on Day 2, and so forth. The crews know exactly when they'll work and go home, and the fatigue issue should be solved.

"What if our train loses an hour on every district — bad weather today? The train won't turn into a pumpkin, but the crews will. By the time it reaches the fourth crew change, it's 0600 instead of 0300, and the fourth crew has burned up 3 of its 12 hours sitting in the register room. They, and the fifth, sixth, and seventh crews can't make it across their districts in their 12 hours, and three dog-catch crews are required. Or, we call them on the telephone, tell them to come to work late, and the whole scheduled work thing starts to disintegrate.

"Suppose we pad the schedule to put 12 hours into each crew district: The train waits for the man, rather than the man waiting for the train. The crews can have regular work starts even if our train snags an air hose on a grade-crossing plank and the conductor spends 45 minutes walking the train, or a motorist smashes through a grade-crossing signal arm, requiring every train to stop and flag the crossing until it's repaired. Now, most trips we will park $10 million worth of locomotives and cars on $3 million worth of siding for 21 hours, waving goodbye forever to the work they could have done. And we've delayed delivery of every shipment on that train 24 hours, too. That will actually be better for the company that owns the covered-hopper load of soda ash worth 3 cents per pound, because erratic deliveries are more costly than the $2 it spends on a day's interest on the soda ash, but it's probably not acceptable to the owner of the container-load of MP3 players at $900 per pound.

This *Times* article has drawn heavily upon external sources for it information and text. Most of the material on the CPR experience has been lifted and edited from: ***The Canadian Pacific Railway Transforms Operations by Using Models to Develop Its Operating Plans*** by Phil Ireland, Rod Case, John Fallis, Carl Van Dyke, Jason Kuehn and Marc Meketon in *Interfaces, 2004,* ***34,*** 5-14.

Material on the history of the Train Order system is taken from the web-site *Hot Times on the High Iron*, by J. D. Santucci

(http://www.railroad.net/)

VR Christmas/New Year 1940/41 Holiday Working Time Table

STEPHEN WARD *reviews item #52 of AATTC's Auction catalogue #23.*

Once again the upcoming *"AATTC - Ted Downs Memorial Auction"* has a wonderful document for collectors to bid for. This VR Special WTT contains details to advise operational staff on altered and additional services provided at one of the traditional peak times for the Victorian Railways.

These documents typically contained a variety of information around operational requirements including:

- Ticket arrangements and conditions
- Road coach connections
- Employee pass restrictions
- General instructions to station staff on monitoring trainloads, preparation and provision of rolling stock and restrictions around goods train services provided and monitoring of perishable goods and livestock.

The introductory pages provide fascinating detail around the logistics required to provide one of the most intense level of services for any time in the year (apart from the Easter period).

One of the most interesting pages in the timetable is now of significant historic importance—the diagram of Spencer Street Station, a standard inclusion in working timetable documents of this time, the layout is worth a good study now that Spencer Street is once again under redevelopment and progressively changing in layout (See our page 13).

The timetable contains a table for each line in operation and either provides a table of alterations and additional services or a notation that regular timetabled service to be provided with local staff to monitor the levels of service. An example of this is the Korong Vale –Ultima Service. An interesting notation here is that the rail motor was to be available for local trips in between regular service (page 13).

Some lines had considerable change, with detailed and complex conditions and instructions. An example of is this is for the Western Line, as can be seen from the instruction page shown. [Unfortunately not received by The Times- Editor]. Other lines such as those to Portland and Queenscliff had changes to regular schedules and—as is the case with

EDWARD T. DOWNS.

DEC 1940

[To be acknowledged and kept for future reference.]

C.15/40.

VICTORIAN RAILWAYS.

Christmas, 1940, and New Year, 1941 Holidays.

EXTRA TRAIN SERVICES

COUNTRY LINES ONLY

Alterations and Additions to Train Services; also Fares, etc.,

For period 7th December to 4th January.

INSTRUCTIONS AND INFORMATION FOR THE STAFF ONLY.

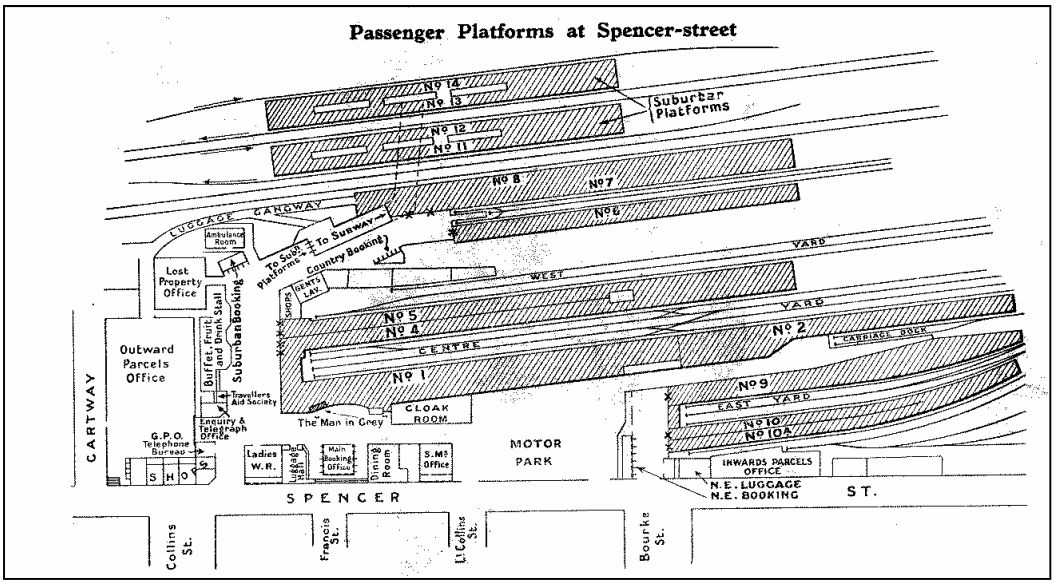
The Passenger, Mixed, and Goods Train services shown herein are additional to those shown in the Working Timetable, which are to have effect as usual, except where otherwise stated, and the arrangements shown herein are to be observed on dates shown.

Copies of this Circular are to be kept available in every Signal-box, Engine-shed, Office, and Room used by the employes concerned, and, in addition, a copy is to be furnished to every Engine-driver, Electric Train Driver, Motorman and Guard concerned. In connection with this see Regulation 8.

References "*, §, ¶, ††, ‖," etc., fully explained on page 7 of W.T.T., are applicable to all the special trains mentioned herein.

M. A. REMFRY,
General Superintendent of Transportation.

Spencer-street, Melbourne, December 4, 1940. 2840—40



As always, when analysing train schedules of the past, it is interesting to look at where trains crossed and how frequently. One of these examples is the Bairnsdale schedule for train No 21.

Other more interesting detail is the notations, which appear attached to each schedule. An example is provided for South-Eastern and Wonthaggi lines. Note no. 32 prides for competent porters be provided to assist guards on certain trains. The note ends saying the "assistants must be men competent for checking". (page 14 lower right).

This document is a great example of the detail that was required to run a special train service over the Christmas/New Year period. Because it is from 1941, it contains details of Victorian Lines of long distant memory or which no longer have passenger service. It is a great addition to any timetable collection – happy bidding.

Queenscliff—an intense service. Portland had some services changed and some through services provided (below right and p14 upper left).

A review of the tables reveals how small things change at some locations. An interesting example is the location known as Goulburn Junction, the end of the double line before crossing the Goulburn River and entering Seymour Yard. (p14, upper right).

Reviewing other more interesting detail reveals the long duration of some journeys in comparison to today. An example of this is the journey to Sydney. The description in *Note A* reveals it was easier to describe where the train didn't stop, rather than where it did stop (p14 lower left).

79 1940 Christmas (Country)

WYCHEPROOF SEA LAKE

S.M., Wycheproof, to ascertain number in No. 61 for Sea Lake and be prepared to replace the Rail Motor with Steam train when necessary.

S.Ms., Sea Lake, Wycheproof, Charlton, Korong Vale and Inglewood, to report number in train on departure of Down and Up trains.

KORONG VALE ULTIMA LINE

Ordinary train service

KORONG VALE ULTIMA ROBINVALE

Traffic by the PE and AEC Rail Motors on the Ultima and Robinvale lines respectively is to be watched during the period December 31 to January 4 and, when necessary, District Superintendent, Bendigo, is to arrange to substitute a Steam train for the PE Rail Motor, and the PE Rail Motor for the AEC.

S.Ms., Korong Vale, Boort, Quambatook, Ultima, Chillingollah and Manangatang to Keep Control, Bendigo, advised of anticipated additional traffic and report to that office (Room 73) total numbers in all trains from December 31 to January 4, leaving their respective stations.

S.M., Ultima, to arrange to provide Rail Motor for Special trips.

124 1940 Christmas (Country)

QUEENSCLIFF LINE

COMPLETE SERVICE (GOODS CANCELLED), SATURDAY, DECEMBER 21, TO WEDNESDAY, JANUARY 1.

Trains will run as under:—

DOWN.	Dec. 26, Jan. 1	Jan. 1	Dec. 26	Dec. 25	Dec. 26, Jan. 1	Dec. 24 Cheap Excursion	SUNDAYS Dec. 22, 29 (B)
	Pass.	Pass.	Pass.		Pass.	Pass.	Pass.
Melbourne ...Dep.	a.m. 6 35	a.m. 8 22	a.m. 8 30	a.m. 8 35	a.m. 11 5	p.m. 9 30	a.m. 9 2
Geelong ... Arr.	8 14 (c)	9 17 (c)	9 37(c)	9 50 (c)	p.m. 12 30 (c)	10 54 (c)	10 35 (c)
,, ...Dep.	9 15 **A**	9 35 **A**	9 50	10 10 **A**	1 30	11 15 **E**	10 50
Sth. Geelong ,,	9 20	9 40	9 55	10 15	1 35	11 20	10 55
Leopold ... ,,	§	§	§	§	§	§	*
Curlewis ... ,,	§	§	§	§	§	§	*
DRYSDALE ,, (see note)	9 50	10 10	10 20	10 40	2 5	11 50	11 25
Mannerim ... ,,	§	§	§	§	§	§	*
Marcus ... ,,	§	§	§	§	§	§	*
Queenscliff ... Arr.	10 10	10 30	10 40	11 0	2 25	a.m. 12 10	11 50
	Cheap Exc'n from Geelong	Cheap Exc'n from Geelong	Cheap Exc'n from Geelong		Cheap Exc'n from Geelong		

UP.	Dec. 26, Jan. 1	Dec. 25, 26, Jan. 1	Dec. 26, Jan. 1	Dec. 26	Dec. 25	SUNDAYS, Dec. 22, 29 (B)
	Pass.	Pass.	Pass.	Pass.	Empty	Pass.
Queenscliff ... Dep.	p.m. 3 50	p.m. 7 0	p.m. 7 25	p.m. 8 20	a.m. 12 25	p.m. 7 0
Marcus ... ,,	§	§	§	*	*	*
Mannerim ... ,,	§	§	§	*	*	*
DRYSDALE ,, (see note)	4 17	7 29	7 52	8 47	12 50*	7 27
Curlewis ... ,,	§	§	§	*	*	*
Leopold ... ,,	§	§	§	*	*	*
Sth. Geelong ,,	4 40	7 57	8 21	9 15	1 15*	7 48
Geelong ... Arr.	4 50 (c)	8 2 (c)	8 25 (c) **J**	9 20	1 20	7 55 (c)
	"Flier"					
,, ... Dep.	5 8	8 35 **(D)**	8 35 **(K)**	To Ballarat	...	8 10
Melbourne ... Arr.	6 5	9 35	9 35	page 101	...	9 35

A—Connects ex Ballarat.

B—Sunday trains will be continued after 29th December as per separate circular to be issued later. On December 22 and 29, 7.0 p.m. Up runs through to Ballarat (page 101).

D—On January 1, depart Geelong, 8.20 p.m., arrive Melbourne 9.22 p.m.

E—Connects with 9.25 p.m. from Ballarat.

J—Leaves Geelong for Ballarat at 8.40 p.m., January 1.

K—8.45 p.m. January 1.

(c)—Passengers change trains at Geelong.

NOTE.—A car is to be attached to the 11.15 a.m. (No. 1) and 2.0 p.m. (No.2) Goods between Geelong and Queenscliff on Thursday, January 2. S.M. Geelong to arrange.

Cheap tickets for the 9.30 p.m. December 24 will be issued only from Melbourne to Drysdale and Queenscliff.

For Fares, etc., by local cheap trips, Geelong to Queenscliff, on December 25, 26 and January 1, see Separate circular. For Sunday cheap fares, see P.F. 14/3 Pass. Train Tariff No. 3, page 106.

S.M., South Geelong, to report the number of passengers in all Down and Up Queenscliff trains.

Officer-in-Charge Queenscliff to submit report per S.M., Geelong, to Supt. Train Services, giving the tally of all the above trains on departure.

ARARAT–HAMILTON–PORTLAND LINE.

On December 21, 23, 24, 25, the 9.5 a.m. (D3) ex Melbourne (page 81), will run through to Portland (see note page 97). S.M., Ararat and Control, to arrange.

On December 21, the 10.50 p.m. (No. 29) will be altered to leave Ararat at 11.40 p.m. as for H5 connecting with 7.2 p.m. (D31) instead of 7.0 p.m. (No. 29).

On December 26, the 6.45 p.m. (No. 25) will be altered to leave Ararat at 10.50 p.m. connecting with the 7.0 p.m. (No. 29) from Melbourne and on January 1, will be altered to leave at 11.40 p.m. connecting with 7.2 p.m. (D31).

The usual connection Ararat to Hamilton with the 2.30 p.m. from Melbourne on December 26 and January 1, will be cancelled. Connection will be made as usual on December 24.

Extra and altered trains will run as shown hereunder :—

DOWN.	No. 17 Through Dec. 21, 23, 24, 25 (Page 81)	H3 Hamilton Dec. 26	H5 Hamilton Special Dec. 24. Nos. 25 and 29 Altd. Dec. 21, Jan. 1 (Page 87)
	a.m.	p.m.	p.m.
Melbourne ... Dep.	9 5 } D3	7 0 } No. 29	7 2 } D31
Ararat ... Arr.	1 17 }	10 38 }	11 21 }
,, ... Dep.	1 40 p.m.	10 50—Instead	11 40
Langi Logan ... ,,	§	§ of 6.45	§
Maroona ... Arr.	2 2—5G	... p.m.	... Dec. 22, 25, a.m. Jan. 2
,, ... Dep.	2 4	11 12	12 3
Willaura ... ,,	2 22	11 28	12 22
Glenthompson ... ,,	2 45—24	11 49	12 44—H4
		a.m.	
Dunkeld ... ,,	3 3	12 7	1 2
Strathkellar ... ,,	3 26	§	§
Hamilton ... Arr.	3 40	12 50	1 40
,, ... Dep.	3 52	Dec. 27	...
Branxholme ... ,,	4 19—42	...	...
Condah ... ,,	4 36	...	...
Heywood ... ,,	5 3	...	...
Portland ... Arr.	5 40	...	...

Stop all stations

Stop all stations

Stop all stations.

UP.	No. 24 Tue. Thur. Sat.	H4 Dec. 24	—	—
	a.m.	p.m.		
Portland ... Dep.	11 40—3	...	...	...
Portland Nth. ... ,,	11 44	...	...	...
Heywood ... Arr.	p.m.	...	...	...
,, ... Dep.	12 15	...	...	...
Condah ... ,,	12 45—7	...	...	...
Branxholme ... ,,	12 58—26	...	...	...
Hamilton ... Arr.	1 30	...	...	...
	Daily			
,, ... Dep.	1 50	11 45	...	...
Dunkeld ... Arr.	...	...	...	...
,, ... Dep.	2 23	12 25 a.m. Dec.	...	...
Glenthompson ... Arr.	2 40—17	12 42—H5 25	...	...
,, ... Dep.	2 47	12 45	...	...
Willaura ... ,,	3 8	1 10	...	...
Maroona ... Arr.	...—10G	...	...	...
,, ... Dep.	3 26	1 35	...	...
Ararat ... Arr.	3 55	2 5 Connect with D2 (Page 90)	...	...

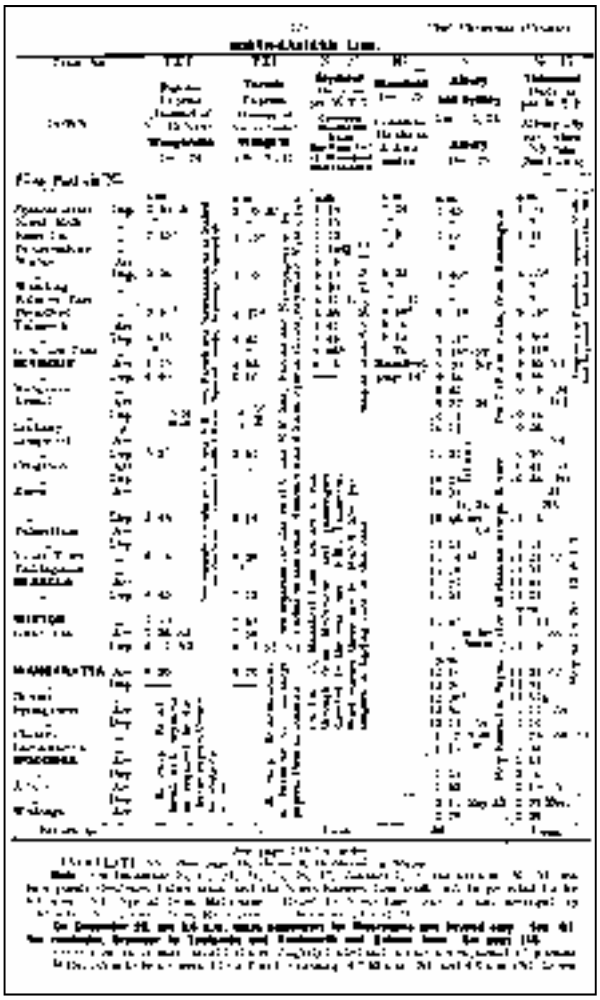
Through Train to Melbourne on certain days see D20 or 22 pages 93, 95.

Stop all stations.

From December 20 to January 2, the 1.40 p.m. Down, 8.0 a.m. Up, and 1.50 p.m. Up are to be run with extra cars, as required, to and from Hamilton, and Vanman provided on heavy days days by Hamilton to assist Guard of 1.50 p.m. if District Supt. considers necessary.

On the days D18 ex Ararat to Melbourne is run (page 93), S.Ms., Portland, Branxholme, Hamilton and Ararat, to confer and suitably arrange make up of trains to facilitate despatch of D20 or D22 from Ararat. See clause 34, page 98.

S.Ms., Ararat, Maroona, Hamilton and Heywood to record on M37A numbers in Specials, also Ordinary trains December 29 to January 3, and send to Supt. Train Services (Room 73).



NOTES RE NORTH-EASTERN LINE DOWN TRAINS.—Continued

MELBOURNE—ALBURY—SYDNEY.

Special and Ordinary trains connect with N.S.W. trains, and stop as shown hereunder :—
See time-tables for days these trains are run.

MELBOURNE Dep	a.m. 7 45	a.m. 8 0	a.m 8 6	p.m. 1 30	p.m. 3 25	p.m. 4 50	p.m. 6 30	p.m. 6 40	p.m. 8 15	p.m. 8 45
	p.m.	p.m.	p.m.						a.m.	a.m.
ALBURY ... Arr.	1 45	2 10	2 10	6 45	8 45	9 45	10 20	11 0	12 35	1 5
,, ... Dep.		3 30 A		7 20	9 20	11 0 B	10 40 D	11 20 E	12 55E	1 35 E
		a.m.		a.m.	a.m.	a.m.	a.m.	a.m.	p.m.	p.m.
SYDNEY ... Arr.		5 45		7 47	8 45	10 4	8 55	10 35	1 24	2 8
		(6.10 Sundays)								

Connecting trains in New South Wales stop as under :—

(A) All stations to Liverpool, except Demondrille, North Goulburn, Murray's Flats, Carrick, Werai, Maldon, and at Strathfield. (On Sundays, also stops where required between Liverpool and Sydney, except Rookwood.)

(B) Culcairn, Henty, The Rock, Wagga Wagga, Junee Junction, Cootamundra, Harden, Yass Junction, Gunning, Goulburn, Moss Vale, Bowral, Bundanoon and Mittagong (Sundays only), and Strathfield. **Connects** at Goulburn for **Canberra.**

(D) Through Sleeping Berth passengers and a limited number of first and second class seat booked passengers for Strathfield and Sydney only. Passengers from Victorian stations holding tickets for Sydney may alight at Moss Vale.

(E) Culcairn, Henty, The Rock, Wagga Wagga, Junee Junction, Cootamundra, Harden, Yass Junction, Gunning, Goulburn, Moss Vale, Bowral and Strathfield (Bundanoon and Mittagong Sundays only).
Does not connect to Canberra.

NOTES RE SOUTH-EASTERN UP TRAINS—Continued.

19. No. 18 Up on December 31 and January 1 is expected to be heavy. S.M., Korumburra, to be prepared to strengthen, and if necessary double head.

20. No. 42 to pick up milk as usual.

24. S.M., Flinders-street, to arrange for Travelling Ticket Collectors to check first Divisions of Up trains Dandenong to Oakleigh, and second divisions Oakleigh to Melbourne. Two Collectors to be sent when traffic is heavy, to check Up South-East trains.

NOTES RE WONTHAGGI UP TRAINS.

27. S.M., Nyora, to arrange with S.M., Flinders-street, for extra cars necessary to Wonthaggi by Down trains, during the Holiday period and confer with S.M., Wonthaggi, respecting Up traffic.

SOUTH-EASTERN AND WONTHAGGI LINES.

GENERAL.

31. S.Ms., Flinders-st. and Nyora, to arrange train crews changing over.

32. Metropolitan Superintendent to arrange to provide competent Porters to assist Guards by following trains on dates considered necessary :—

8.20 a.m. Down to Nyora, and return by 18 Up.

6.0 p.m. and 6.40 p.m. Down S.E., to travel through to meet 42 Up. The regular Vanman should be on the 6.0 p.m. Down and No. 42 Up.

These assistants must be men competent for checking.

The Municipal Tramways Trust on New Year's Day 1952 special working arrangements no. 2752

DAVID HENNELL, *AATTC's resident South Australian expert, reviews an unusual timetable document from Adelaide's Municipal Tramways Trust. This is item #144 in the current AATTC auction catalogue.*

Adelaide has always been an interesting public transport city as it has traditionally done things differently from anywhere else - it had many suburban railways than ran down the street, the electrification of its large horse tram network occurred well after electric cars were introduced elsewhere, the O-Bahn, the enormous task of transporting huge crowds to Glenelg firstly by train and later by tram for the Foundation Day celebrations on 28th December each year, the SAR running its own buses in direct competition with its trains, many railways catering exclusively for industrial passenger traffic (and not just traffic due to World War II), a purely tourist branch tram line (although the inner part of it carried initially infrequent regular traffic), significant feeder buses to tram termini, and so on. The document reviewed here, though, deals with more traditional types of service operated on public holidays.

The Special Working Arrangements No. 2752 circular of the MTT covers the tram service for Tuesday 1st January 1952 and the trolleybus and motor bus service for the three days Saturday 29th December, Monday 31st December 1951 and New Year's Day 1952.

The document consists of 16 quarto* duplicated sheets, most of which are printed double sided. The pages are numbered in an unusual manner: the first five are headed A to G and the remaining twenty one are 1 to 12, 12A, 13 to 20.

Page A lists vehicle requirements for New Year's Day, the maximum number being between 6.30pm and 8.00pm when 191 trams, 14 single deck and 11 double deck motor buses and 43 trolleybuses were in traffic. Also listed are the public attractions (carnivals at Glenelg and Semaphore, theatres, Morphettville races and evening trotting at the Showground), a statement that Saturday tram services would operate on all routes except North Walkerville to Hyde Park, Paradise and St. Peters to Glen Osmond and Fullarton, Burnside, Erindale and Linden Park, Henley (sic), Glenelg and Morialta which operated to differing holiday timetables. The Amusement Despatch after the evening cinema and theatre sessions was "Holiday Schedule plus additional trams on account of Trotting Meeting."

Page B provides some information about New Year's Day Morphettville, Showground, Glenelg, Henley ("The six minute service will cut in as from 10.00am ex Currie St.") and Morialta trams. With reference to motor buses and trolleybuses, "Ordinary Sat. T.T. will be in operation on Firle and Woodville Nth., all other services will be Special Hol. TTs. Crews are available at Hack.Depot (sic) for buses for Morphettville race traffic as required prior and subsequent to races." [*Note: the original omits the space between "Hack." and "Depot", hence my* (sic).]

Pages C to G give motor bus and trolleybus details. (*Page C illustration overleaf*)

Pages 1 to 20 deal with tram details including layover arrangements at Morphettville, Colley Terrace (Glenelg) and the Showground. (*3 illustrations, our pages 13 to 15*)

In 2005, there would be additional cars for races at Morphettville, buses for Victoria Park and Cheltenham races and the trains would stop at Cheltenham Racecourse station but otherwise just the standard Sunday timetable everywhere. Not a patch on the old days!

* See note on paper sizes, our p2.

Editor's note: A favourite Trivia question of 1950s TV buffs is "How do you spell *Mud?*"- and the answer is "with 2 d's". *Jet Jackson* fans will know what I mean. There is an equivalent for AATTC groupies and it is "How do you spell *Hennell*"? And the answer is, of course, "with two *l*'s". The Editor has, on more than one occasion, been guilty of getting this wrong. Apologies to David for past injustices and we hope the worst is now past us. But just check the by-line again to be sure!

THE MUNICIPAL TRANSPORT TRUST, [illegible]

SPECIAL WORKING ARRANGEMENTS

ORDERS FOR THE DAY – SATURDAY, 29/12/51.
MONDAY, 31/12/51.
TUESDAY 1/ 1/52.

MOTOR BUS AND TROLLEYBUS SERVICES.

Firle	Ordinary Saturday T.T.
Firle – Graymore	Holiday T.T. No. 3
Kingsland	" " No. 6
Tasmore – Lamps & Semaphore	" " No. 7

/ denotes – Then as per T.T. set out above

Run No.	Type	Dep. Back. Depot	via	Instructions.
A.M. DESPATCH				
[illegible]	T	6.07	Direct	Dep.Jeq.Tee.6[illegible]Com to Sema.✓ On dept/e.Tasmore 11.30 pm.direct to Port Depot.arr.12.28am.
405	T	6.45	"	Dep.Jeq.Tee.6.48am to Sema.✓
51	DD	6.50	Nth.Tee.	Dep.".Tee.6.46 to Sema..dep.Sema.6.19,dep.Nth.Tee. 6.59 ✓
1	SD	6.16	Direct	Dep.Wellington Rd. 6.23 to Firle ✓
414	T	6.12	"	Dep.Tasmore 6.29 to Sema.✓
53	DD	6.10	Nth.Tee.	Dep.".Tee.6.17 to Graymore ✓
54	DD	6.20	"	" 6.27 to Somerton ✓
42	SD	6.26	Direct	Dep.Robe Tee.6.31 to Northfield ✓
58	DD	6.40	Nth.Tee.	Dep.N.Tee.6.47 to Graymore ✓
417	T	6.50	Direct	Dep.Deq.Tee. 6.53 to Lamps ✓
41	SD	6.48	"	Dep.Robe Tee.6.53 to Hampstead ✓
55	DD	7.01	Nth.Tee.	Dep.N.Tee. 7.08 to Graymore ✓
419	T	7.02	Direct	Dep.Deq.Tee. 7.05 to Sema.✓
423	T	8.01	"	" 8.04 to Lamps ✓ On dept/e.Tasmore 11.52 direct to Port Depot, arr.depot 12.39am.
456	DD	9.17	Nth.Tee.	Dep.Nth.Tee.9.27 to Somerton ✓
8X	SD	9.18	"	Meet run to North Tee.,
57	DD	9.47	"	Dep.Nth.Tee.9.57 to Graymore ✓
60	DD	10.12	"	" 10.22 to Gordon St.✓
440	T	10.29	Direct	Dep.Deq.Tee.10.32 to Sema.✓
61	DD	10.32	Nth.Tee.	Dep.Nth.Tee.10.42 to Gordon St.✓
62	DD	10.52	"	" 11.02 to Gordon St.✓
P.M. DESPATCH				
2	SD	11.39	Direct	Dep.Wellington Rd.11.46 to Firle ✓
55	DD	1.05	Nth.Tee.	Changeover bus for Run 56.
56	DD	1.37	"	" Run 56.
52	DD	1.41	"	" Run 52.
443	T	3.59	direct	Dep.Jeq.Tee.4.02 to Sema.✓

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THE MUNICIPAL TRAMWAYS TRUST, ADELAIDE.

SPECIAL WORKING ARRANGEMENTS

ORDERS FOR THE DAY - NEW YEARS DAY -TUESDAY, 1/1/52 - NO.2758

MIDDAY BROKEN SERVICE DESPATCH HACKNEY DEPOT

xx denotes - Then as Sat. T.T. & S.W.A.

Run No.	Depart Hack. Depot	Via	Instructions
59	10.54	Nth.Tce.	Dep.Gren.St.11.02am,dep.Col.Lt.Gdns.11.30 am. " " " 11.58am," Enfield 12.21 pm xx.
62	11.30	"	Dep.Gren.St.11.38am,dep.Col.Lt.Gdns.12.07pm. " " " 12.34pm,dep.Enfield 1.01 pm xx.
177	12.00	P&O.Sts.	Dep.Gren.St.12.10pm,showing Firle signs,dep. Tranmere 12.40pm,dep.Gren.St.1.06pm showing Firle signs dep.Magill 1.40pm,dep.Gren.St.2.16 pm. Arr.Hack.Depot 2.24pm.
179	12.30	Direct	Dep.Tranmere 12.49pm and connect with Bus at Wellington Rd.,dep.Gren.St.1.09.Arr.Hack.Depot 1.17pm.
303	12.58	P&O.Sts.	Dep.Gren.St.1.06 in div.with and behind Run 302 dep.Merialta 1.44pm,then as Hol.T.T.'D'.

THE MORPHETTVILLE TRAMWAY TRUST, ADELAIDE.

SPECIAL WORKING ARRANGEMENTS No. 2758.

ORDERS FOR THE DAY - NEW YEARS DAY TUESDAY, 1/1/52

RACE AT MORPHETTVILLE - DOG DISTRICT

/ denotes - on completion down race traffic bank trams at Morphettville and standby on trams - also see I.M. Despatch.

WCT denotes - on completion down race traffic bank trams on western track Colley Tce, and standby on trams - also see I.M. Despatch

ECT denotes - on completion down race traffic bank trams on eastern track Colley Tce, and standby on trams - also see I.M. Despatch

Motormen to instruct conductors to count passengers and notify Inspector at Morphettville as to number carried

The attention of crews standing by on trams when banked is drawn to Rule 66 - Book of rules and regulations - which provides that when trams are laying over employees must not leave trams without permission of Inspector.

Run No.	Type	Dep. Rack. Depot	Dep. City Depot	Arr. Vic.Sq. West	Instructions
320	SS	-	10.40	10.45	Tram as draft, on completion down loading bank trams Moseley Sq, and standby on trams also see I.M. Despatch
320	F	10.43	-	10.55	WCT r.M. out in ns run 178
321	F	10.48	-	10.55	WCT " 196
321	SS	-	11.00	11.05	ECT
322	F	10.59	-	11.10	WCT " 104
323	F	10.59	-	11.10	WCT " 102
322	SS	-	11.10	11.15	ECT
324	F	11.07	-	11.20	WCT " 176
325	F	11.07	-	11.20	WCT " 195
323	SS	-	11.20	11.25	ECT
326	F	-	11.26	11.30	WCT " 31
327	F	-	11.25	11.30	WCT " 101
324	SS	-	11.33	11.38	/
328	F	-	11.36	11.41	WCT " 58
329	F	11.25	-	11.41	WCT " 32
330	F	11.32	-	11.45	/ " 170
[illegible]	F	11.32	-	11.45	/ " 64

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THE MUNICIPAL TRAMWAYS TRUST. ADELAIDE.

SPECIAL WORKING ARRANGEMENTS

CHANGES FOR THE DAY - NEW YEARS DAY - 1/1/52. No. 2752

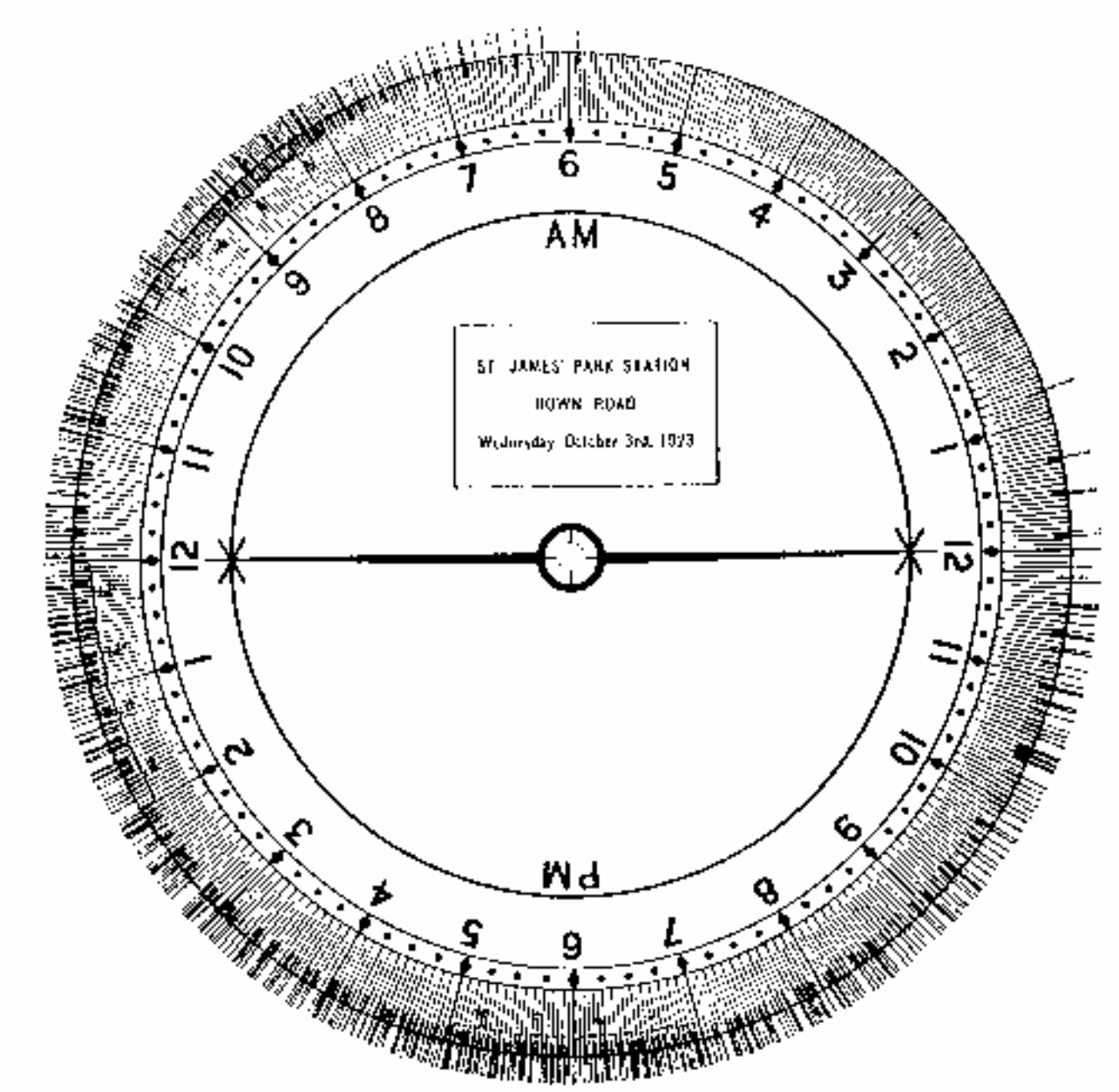
TROTTING AT SHOWGROUND - RETURN DESPATCH.

xx denotes - Then as Sch. TT & SS.
ø " - Then as directed - "Cut In".

Run No.	Dep. Hack. Depot	Dep. City Depot	via	Arr. Show-ground	Instructions.
	p.m.			p.m.	
370H2	-		-	-	Laying up Car in as directed.
371H2	-		-	-	" "
372H2	-		-	-	" "
373H2	-		-	-	" "
374H2	-		-	-	" "
195	9.15	-	Direct	9.35 ø	dep. Gren. St. 10.44pm. to Kensington. xx.
149	9.15	-	"	9.35 ø	" 10.46 " St. Peters Then as Sch. TT. No. 2
155	-	9.18	"	9.35 ø	" 10.48 dep. Fullarton 11.12pm. arr. City Depot 11.34pm.
150	9.15	-	"	9.35 ø	" 10.50pm. to Paradise, then as Sch. TT No. 2
220	-	9.18	"	9.35 ø	dep. Currie St. 10.53pm. dep. Lockleys 11.10pm. " 11.28 " 11.4[illegible] " Arr. City Depot 12.06am.
97	9.15	-	"	9.35 ø	dep. Gren. St. 11.01 pm. dep. [illegible] 11.2[illegible]pm. Arr. Hack. Depot 11.44pm.
151	10.13	-	"	10.34 ø	dep. Gren. St. 10.56pm. dep. Payneham 11.19pm. Arr. Hack. Depot 11.34pm.
153	10.13	-	"	10.34 ø	dep. Gren. St. 10.59pm. dep. Glenunga 11.21pm. Arr. Hack. Depot 11.43pm.
65	-	10.33	"	10.46 ø	dep. Gren. St. 11.12pm. dep. Col. L. Gdns. 11.41pm. Arr. City Depot 12.08am.
157	10.27	-	"	10.46 ø	dep. Gren. St. 11.02pm. dep. Fullarton 11.25pm. arr. Hack. Depot 11.47pm.
61	10.27	-	"	10.46 ø	dep. Gren. St. 11.06pm. dep. Col. L. Gdns. 11.34pm. arr. Hack. Depot 12.0[illegible]am.
152	10.27	-	"	10.46 ø	dep. Gren. St. 11.08pm. dep. Payneham 11.2[illegible]pm. Arr. Hack. Depot 11.43pm.
160	10.27	-	"	10.46 ø	dep. Gren. St. 11.08pm. dep. Springfield 11.35pm. Arr. Hack. Depot 11.59pm.
105	10.27	-	"	10.46 ø	dep. Gren. St. 11.10pm. dep. Hyde Park 11.28pm. Arr. Hack. Depot 11.54pm.
15	10.27	-	"	10.46 ø	dep. Gren. St. 11.15pm. in div. with 6 car dep. Sh'gd. 11.50pm. arr. Hack. Depot 12.[illegible]
275	10.27	-	"	10.46 ø	dep. Currie St. 11.12pm. dep. Hilton 11.29pm. arr. Hack. Depot 11.52pm.

Graphic Insight #84

London Underground train recorder from 1923



Like some kind of retro-sixties mullet-cut, the hairs sticking out of the rim of this 'clock' represent another kind of train timetable. We show here the paper chart output of a train recorder from St James Park Underground station on the Circle and District Lines. The chart, which dates from the 1920s, clearly shows the morning and evening peaks, when some 40 trains per hour pass through. Not a single train has triggered the device in the nearly 4 hours before 6 a.m.- not even a works train. The Underground was a leader when it came to modern electromechanical devices like this. As early as 1940, it introduced timetable-driven automatic point operation– a kind of gloried pianola roll punched with holes representing when and where each train was to run, driven by clockwork and with "magic fingers" to detect the holes punched therein and to adjust the points and signals accordingly. It persisted well into the late twentieth century.