Real Time Train
GTFS & GTFS- R Technical Document

Contents

.

Document Control

Revision History

Version	Author	Issue Date	Changes
1	TfNSW	12/2/2013	Initial version
2	TfNSW	06/09/2014	Updated for TripUpdates GTFS Static Bundle Changes
2.1	TfNSW	18/09/2014	Formatted into standard report template. Consolidated access and tech document into one primary document
2.2	TfNSW	11/12/2014	Updated GTFS reference and added headsign information.
2.3	TfNSW	04/03/2016	Included charter services (section 2.2.1 and 2.2.4)
2.4	TfNSW	16/03/2016	Revised for Open Data

References

Document Name	Network Location or Documentation Link
GTFS Reference , October 15, 2012 revision.	https://developers.google.com/transit/gtfs/changes#october-15-2012
GTFS-realtime, v1.0 October 12,2013 revision.	https://developers.google.com/transit/gtfs-realtime/changes#oct-12-2012

1   GTFS Bundle Notes

1.1 Agency.txt

Trains run by both Sydney Trains & NSW Trains will be contained within the bundle.

Times for NSW Trains running beyond the intercity network area (bordered by Goulburn, Bathurst, Scone, Dugong and Nowra) will not be accurate beyond these stations.

1.2 trips.txt

1.2.1   trip_id

The trip_id used to uniquely identify trips has a semantic content that could be used to provide additional information about the timetabled train. The format is as follows:

<trip_name>.<timetable_id>.<timetable_version_id>.<dop_ref>.<set_type>.<number_of_cars>.<trip_instance>

Eg. '123J.1171.00000102.124.T.8.0'

The bundle contains trips scheduled for operational and scheduling purposes. Presently 590-599 series trip_name is reserved for Charter services that should not be displayed to customers (e.g 590A). Hardcoding this rule is not recommended.
Trips with route RTTA_REV and RTTA_DEF should also not be displayed to customers. They are non-revenue services and trips that are not matched to a valid route.

<timetable_id>.<timetable_version_id>.<dop_ref> represent the calendar, so could provide indications the bundle is out of date if values in real time feeds do not match bundle calendar values.

The fields *<timetable_id>.<timetable_version_id>.<dop_ref> within the tripid is not recommended for use. This is reserved to keep the trip id unique.*

1.2.2   Train Set Types

The following are the possible values that could be found in the *<set_type>* field of the trip_id for passenger trains.

Value	Train Set Type
A	Waratah
C	C Set
H	Oscar
J	Hunter
K	K Set

M	Millennium
N	Endeavour
P	Xplorer
S	S Set
T	Tangara
V	Intercity
X	XPT
Z	Indian Pacific

Other codes that could be encountered are

Value	Train Set Type
B	Bus
D	Diesel Locomotive
F	Slow Freight
L	Lt Loco
O	Other
Q	Maintenance Track Machine
W	Fast Freight
Y	Other

1.2.3   block_id

The trips recorded in the GTFS bundle timetable include both trips running 'in service', as well as those running 'out of service'. A single trip could have both in service & out of service sections in its journey (Out of service sections must be at start and/or end of a trip).

Trips which are out of service for their entire journey can be identified as follows:

❖ All stops will have pickup ✖, drop off ✖

Trips which are out of service for only part of their journey, can have their out of service sections identified as follows:

❖ Start – All stops from start of trip with pickup ✖, drop off ✖, till a stop with pickup ✓ is encountered.

❖ End – All stops working forwards from end of trip with pickup ✖, drop off ✖, till a stop with drop off ✓ is encountered

The Trip's block_id has been used to identify sequences of trips for which a passenger can remain on the train in continuous travel (both continuing in the same direction, or a turn-around service) as per the GTFS specification.

The following diagram seeks to show several of the scenarios around blocking, in service & out of service trips as well as the pickup drop off flags that may occur and what to expect. Shown is a single 'roster', representing a series of trips made by a single train in a day.
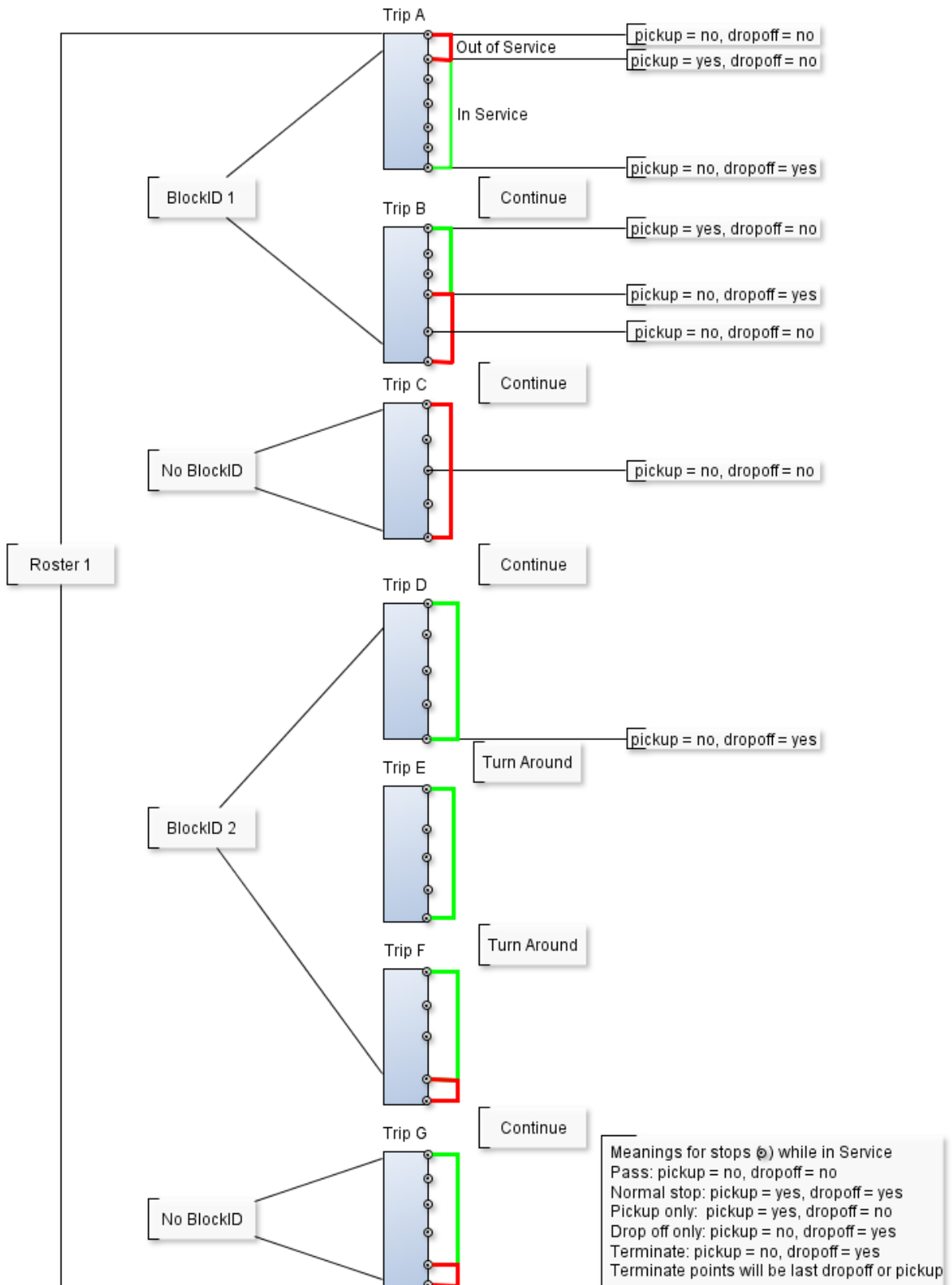
Figure 1-1 Blocking and Trip Example

1.2.4   trip_headsign

The trip_headsign is populated with destination for the passenger journey and is in the form <Destination Station name>.

The trip_headsign for a charter service is set to 'Charter'.

If a via station information exists then this is provided in the trip_headsign as <Destination Station name> via <Via Station name>.

If the headsign changes during a trip, an override is specified in stop_headsign field in stop_times.txt.

2   GTFS-R Vehicle Position

2.1 Coverage

Vehicle coverage is provided for the Sydney Metro region, excluding the Carlingford line & Waterfall station.

2.2 Non Timetabled Trains

The vehicle position feed can contain data for non-timetabled trains in addition to those in the GTFS bundle. Non timetabled trips will have a different trip id format as follows:

NonTimetabled.<trip_name>

2.3 VehicleID

The vehicle Id field has semantic content and is formed by a dot (.) separated list of the carriage identification numbers forming a train.

e.g. 7654.7655.7656.7657.8532.8533.8534.8535

These are carriage numbers which have been masked.

2.4 Example

```
entity {
  id: "6"
  vehicle {
    trip {
      trip_id: "128J.1171.00000104.124.S.8"
      schedule_relationship: SCHEDULED
      route_id: "WL_1b"
    }
    position {
      latitude: -33.864037
      longitude: 151.04587
    }
    timestamp: 1360750370
    congestion_level: UNKNOWN_CONGESTION_LEVEL
    vehicle {
      id: "1340.1341.1342.1343.1344.1345.1346.1347"
      label: "09:55:00 Central Station to Richmond Station Passenger
train"
    }
  }
}
```

3 GTFS-R Service Alerts

3.1 Coverage

Service Alerts are provided for the following categories:

- Line status – Generic information relating to current operation on a line. e.g. delays, track work

- Station facilities information – Information regarding lifts and escalator breakdowns / maintenance

- General station information – Other general messages relating to stations

- Trip information – messages regarding current state of specific trips. E.g. delays, cancellation.

3.2 Trip Based Service Alerts

Trip based Service Alerts are used to convey information around train running for that trip. These would generally be short messages related to delay announcements and reasons.
When service levels (On time running) around the network degrade during disruption events, It is anticipated that individual trip delay style messages will reduce and be replaced by appropriate Line status messages regarding the disruption.

3.3 Examples

Line service alert information:

```
entity {
  id: "1"
  alert {
    informed_entity {
      agency_id: "SydneyTrains"
      route_id: "BL_1a"
    }
    url {
      translation {
        text: "http://www.cityrail.info"
        language: "en"
      }
    }
    header_text {
      translation {
        text: "Major Delays"
        language: "en"
```

```
      }
    }
    description_text {
      translation {
        text: "Signalling failure."
        language: "en"
      }
    }
  }
}
```

Trip based alert:

```
entity {
  id: "3"
  alert {
    informed_entity {
      agency_id: "SydneyTrains"
      trip {
        trip_id: "12-E.1171.105.124.T.8"
      }
    }
    url {
      translation {
        text: "http://www.cityrail.info"
        language: "en"
      }
    }
    header_text {
      translation {
        text: "Trip Update"
        language: "en"
      }
    }
    description_text {
      translation {
        text: " Cancelled Due to electrical repairs."
        language: "en"
      }
    }
  }
}
```

Station facilities alert:

```
entity {
  id: "5"
  alert {
    informed_entity {
      agency_id: "SydneyTrains"
      stop_id: "200060"
    }
```

```
            url {
              translation {
                text: "http://www.cityrail.info"
                language: "en"
              }
            }
            header_text {
              translation {
                text: "Escalator Unavailable"
                language: "en"
              }
            }
            description_text {
              translation {
                text: "Platform 24/25 and ESR Concourse"
                language: "en"
              }
            }
          }
        }
```

4 GTFS-R Trip Updates

TripUpdates provide predicted arrival and departure time for stops along the trip. They also provide information for any changes done on the trip running on that day.

4.1 Delay

For Time Predictions – delay in stop time updated is used to communicate arrival and departure delay in seconds to a scheduled GTFS Trip.

4.2 Line status

This contains generic information relating to current operation on a line. eg. Delays

4.3 Examples

```
entity {
  id: "293E.617.130.120.H.8.0"
  trip_update {
    trip {
      trip_id: "293E.617.130.120.H.8.0"
      schedule_relationship: SCHEDULED
      route_id: "NCCL_2b"
    }
    stop_time_update {
      arrival {
        delay: 0
      }
      departure {
        delay: 42
      }
      stop_id: "2079101"
      schedule_relationship: SCHEDULED
    }
    stop_time_update {
      arrival {
        delay: 42
      }
      departure {
        delay: 42
      }
      stop_id: "2077291"
      schedule_relationship: SCHEDULED
    }
    stop_time_update {
      arrival {
        delay: 42
      }
      departure {
        delay: 0
      }
      stop_id: "2077301"
      schedule_relationship: SCHEDULED
    }
    stop_time_update {
      arrival {
        delay: 0
      }
      departure {
        delay: 0
      }
      stop_id: "2077311"
      schedule_relationship: SCHEDULED
    }
    timestamp: 1409869080
  }
}
```

Any changes to a Trip on a day would be shown as a replacement. They typically include scenarios like Added Stops, Skipped Stops, Cancel Trip, Terminate Early, Change Start, Change Platform, Insert Trip, Reroute Trip, Extend Trip, Hold Trip

```
entity {
  id: "5566.617.130.32.C.2.0"
  trip_update {
    trip {
      trip_id: "5566.617.130.32.C.2.0"
      schedule_relationship: ADDED
      route_id: "NSL_1"
    }
    stop_time_update {
```

```
      arrival {
        time: 1409874540
      }
      departure {
        time: 1409874540
      }
      stop_id: "2000336"
    }
    stop_time_update {
      arrival {
        time: 1409874690
      }
      departure {
        time: 1409874750
      }
      stop_id: "2000393"
    }
    stop_time_update {
      arrival {
        time: 1409874846
      }
      departure {
        time: 1409874888
      }
      stop_id: "2000404"
    }
    stop_time_update {
      arrival {
        time: 1409875086
      }
      departure {
        time: 1409875116
      }
      stop_id: "206142"
    }
    stop_time_update {
      arrival {
        time: 1409875200
      }
      departure {
        time: 1409875260
      }
      stop_id: "2060104"
    }
    stop_time_update {
      arrival {
        time: 1409875356
      }
```

```
      departure {
        time: 1409875386
      }
      stop_id: "2060112"
    }
    stop_time_update {
      arrival {
        time: 1409875488
      }
      departure {
        time: 1409875518
      }
      stop_id: "2065162"
    }
    stop_time_update {
      arrival {
        time: 1409875632
      }
      departure {
        time: 1409875662
      }
      stop_id: "2065153"
    }
    stop_time_update {
      arrival {
        time: 1409875788
      }
      departure {
        time: 1409875818
      }
      stop_id: "206452"
    }
    stop_time_update {
      arrival {
        time: 1409875932
      }
      departure {
        time: 1409875962
      }
      stop_id: "2067144"
    }
    stop_time_update {
      arrival {
        time: 1409876280
      }
      departure {
        time: 1409876310
      }
```

```
      stop_id: "207263"
    }
    stop_time_update {
      arrival {
        time: 1409876430
      }
      departure {
        time: 1409876460
      }
      stop_id: "2073162"
    }
    stop_time_update {
      arrival {
        time: 1409876598
      }
      departure {
        time: 1409876628
      }
      stop_id: "2074182"
    }
    stop_time_update {
      arrival {
        time: 1409876718
      }
      departure {
        time: 1409876748
      }
      stop_id: "2074192"
    }
    stop_time_update {
      arrival {
        time: 1409876832
      }
      departure {
        time: 1409876862
      }
      stop_id: "2076242"
    }
    stop_time_update {
      arrival {
        time: 1409876964
      }
      departure {
        time: 1409876994
      }
      stop_id: "2077312"
    }
    stop_time_update {
```

```
      arrival {
        time: 1409877114
      }
      departure {
        time: 1409877174
      }
      stop_id: "2077302"
    }
    timestamp: 1409851188
  }
}
```

REPLACEMENT service

```
entity {
  id: "108B.617.130.124.T.8.0"
  trip_update {
    trip {
      trip_id: "108B.617.130.124.T.8.0"
      schedule_relationship: REPLACEMENT
      route_id: "NL_1a"
    }
    stop_time_update {
      arrival {
        time: 1409870700
      }
      departure {
        time: 1409870700
      }
      stop_id: "2000336"
    }
    stop_time_update {
      arrival {
        time: 1409870856
      }
      departure {
        time: 1409870916
      }
      stop_id: "2000393"
    }
    stop_time_update {
      arrival {
        time: 1409871012
      }
      departure {
        time: 1409871054
      }
```

```
      stop_id: "2000404"
    }
    stop_time_update {
      arrival {
        time: 1409871240
      }
      departure {
        time: 1409871270
      }
      stop_id: "206142"
    }
    stop_time_update {
      arrival {
        time: 1409871414
      }
      departure {
        time: 1409871474
      }
      stop_id: "2060104"
    }
    stop_time_update {
      arrival {
        time: 1409871570
      }
      departure {
        time: 1409871600
      }
      stop_id: "2060112"
    }
    stop_time_update {
      arrival {
        time: 1409871702
      }
      departure {
        time: 1409871732
      }
      stop_id: "2065162"
    }
    stop_time_update {
      arrival {
        time: 1409871864
      }
      departure {
        time: 1409871894
      }
      stop_id: "2065153"
    }
    stop_time_update {
```

```
      arrival {
        time: 1409872020
      }
      departure {
        time: 1409872050
      }
      stop_id: "206452"
    }
    stop_time_update {
      arrival {
        time: 1409872314
      }
      departure {
        time: 1409872315
      }
      stop_id: "2067143"
    }
    timestamp: 1409872237
  }
}
```

5 Appendix – Duplicate Sydney Trains and NSW Trains services

The following list of trips represent services that appear in both the Sydney Trains realtime feed and NSW Trains rural and regional realtime feed. For consumers using both feeds, TfNSW recommends filtering out these services from the Sydney Trains feed and preferentially using the NSW Trains feed.

Diesel NSW Trains service (NP, NT, V, SN, SP, ST, WN, WP, WT, KN, CN

IC-Hunter Line - Up		
Scone / Dungog - Hamilton		
Monday to Friday		
Saturdays, Sundays and Public Holidays		
Ride Id:	Trip:	Consist:
10536	V618	2N
10537	V622	2N
10539	V638	2N
10543	V676	2N
10544	V682	2N
10545	V682	2N
10546	V700	2J
10548	V702	2J
10549	V702	2J
10551	V704	2J
10553	V706	2J
10554	V708	2J
10556	V710	2J
10557	V710	2J
10560	V712	2J
10562	V714	2J
10565	V716	2J
10569	V720	2J
10571	V722	2J
10572	V722	2J
10575	V724	2J
10578	V728	2J
10580	V730	2N
10581	V730	2J
10584	V732	2J
10585	V734	2J
10586	V734	2J
10589	V736	2J

10591	V738	2J
10594	V740	2J
10596	V742	2J
10597	V742	2J
10602	V744	2J
10603	V744	2J
10607	V748	2J
10608	V748	2J
10611	V750	2J
10614	V752	2J
10615	V754	2N
10616	V754	2J
10619	V756	2J
10621	V758	2J
10622	V758	2J
10623	V760	2J
10626	V762	2N
10627	V762	2J
10628	V764	2J
10630	V766	2J
10631	V766	2J
10632	V768	2J
10634	V770	2J
10635	V770	2J
10637	V772	2J
10639	V774	2J
10642	V776	2J
10644	V778	2J
10645	V778	2J
10648	V780	2J
10650	V782	2J
10653	V784	2J
10655	V786	2J
10657	V788	2J
10659	V790	2J
10660	V790	2J
10661	V792	2J
10667	V918	2N
10669	V926	2J
10671	V938	2J
10673	V946	2J
10675	V958	2J
10678	V966	2J
10680	V974	2J
10681	V974	2J

IC-Hunter Line - Dn		
Hamilton - Scone / Dungog		
Monday to Friday		
Saturdays, Sundays and Public Holidays		
Ride Id:	Trip:	Consist:
10534	V603	2N
10535	V607	2N
10538	V625	2N
10540	V659	2N
10541	V669	2N
10542	V671	2N
11455	V701	2J
11456	V701	2J
11457	V703	2J
11458	V703	2J
10552	V705	2J
10555	V709	2J
10558	V711	2J
10559	V711	2J
10561	V713	2J
10563	V715	2J
10564	V715	2J
10566	V717	2J
10567	V719	2J
10568	V719	2J
10570	V721	2J
10573	V723	2J
10574	V723	2J
10576	V727	2J
10577	V727	2J
10579	V729	2J
10582	V731	2J
10583	V731	2J
10587	V735	2J
10588	V735	2J
10590	V737	2J
10592	V739	2J
10593	V739	2J
10595	V741	2N
10599	V743	2J
10600	V743	2J
10601	V743	2J
10604	V745	2J

Ride Id	Trip	Consist
10605	V747	2J
10606	V747	2J
10610	V749	2N
10612	V751	2J
10613	V751	2J
10617	V755	2J
10618	V755	2J
10620	V757	2N
10624	V761	2J
10625	V761	2J
10629	V765	2J
10633	V769	2J
10636	V771	2J
10638	V773	2J
10640	V775	2J
10641	V775	2J
10643	V777	2J
10646	V779	2J
10647	V779	2J
10649	V781	2J
10651	V783	2J
10652	V783	2J
10654	V785	2J
10656	V787	2J
10658	V789	2J
10662	V793	2J
10663	V793	2J
10664	V797	2J
10665	V907	2N
10666	V913	2J
10668	V925	2J
10670	V933	2J
10672	V945	2J
10674	V953	2J
10676	V965	2J
10679	V967	2J

South Coast - diesels		
Monday to Friday		
Saturdays, Sundays and Public Holidays		
Ride Id:	Trip:	Consist:

10160	CN90	2N
10240	KN01	2N
10241	KN01	2N
10243	KN03	2N
10244	KN07	2N
10245	KN09	2N
10246	KN10	2N
10247	KN17	2N
10248	KN18	2N
10249	KN19	2N
10250	KN20	2N
10251	KN23	2N
10252	KN23	2N
10253	KN24	2N
10254	KN27	2N
10255	KN28	2N
10256	KN33	2N
10257	KN35	2N
10258	KN36	2N
10259	KN36	2N
10260	KN40	2N
10261	KN41	2N
10262	KN42	2N
10263	KN43	2N
10264	KN48	2N
10265	KN48	2N
10266	KN49	2N
10267	KN51	2N
10268	KN55	2N
10269	KN56	2N
10270	KN56	2N
10271	KN57	2N
10272	KN59	2N
10273	KN64	2N
10274	KN64	2N
10275	KN65	2N
10276	KN68	2N
10277	KN71	2N
10278	KN72	2N
10279	KN72	2N
10280	KN73	2N
10281	KN76	2N
10282	KN80	2N
10283	KN81	2N
10284	KN82	2N

10286	KN86	2N

Southern Highlands (diesels 2N or SN sets)		
Monday to Friday		
Saturdays, Sundays and Public Holidays		
Ride Id:	Trip:	Consist:
11386	SN20	2N
11387	SN20	2N
11364	SN21	2N
11366	SN23	2N
11388	SN24	2N
11389	SN24	2N
11390	SN25	2N
11391	SN25	2N
11367	SN26	2N
11392	SN27	2N
11393	SN28	2N
11394	SN28	2N
11395	SN29	2N
11396	SN30	2N
11397	SN31	2N
11398	SN31	2N
11369	SN32	2N
11399	SN32	2N
11400	SN33	2N
11401	SN34	2N
11402	SN34	2N
11403	SN35	2N
11404	SN35	2N
11405	SN36	2N
11406	SN38	2N
11407	SN39	2N
11408	SN39	2N
11409	SN40	2N
11370	SN40/2	2N/4N
11410	SN43	2N
11411	SN43	2N
11412	SN44	2N
11413	SN44	2N
11414	SN45	2N
11415	SN46	2N

11416	SN48	2N
11417	SN49	2N
11418	SN49	2N
11419	SN50	2N
11420	SN51	2N
11421	SN52	2N
11371	SN53	4N
11422	SN53	2N
11373	SN54	4N
11423	SN54	2N
11424	SN55	2N
11425	SN55	2N
11426	SN56	2N
11427	SN59	2N
11428	SN59	2N
11429	SN60	2N
11430	SN61	2N
11375	SN61/3	4N/2N
11431	SN64	2N
11432	SN65	2N
11433	SN67	2N
11434	SN68	2N
11376	SN69	2N
11435	SN70	2N
11436	SN71	2N
11437	SN72	2N
11438	SN73	2N
11439	SN74	2N
11440	SN75	2N
11441	SN76	2N
11442	SN77	2N
11443	SN78	2N
11444	SN79	2N
11377	SN80	2N
11378	SN82	2N
11445	SN85	2N
11446	SN85	2N

West Blue Mountains (diesels 2N or WN sets)
Monday to Friday
Saturdays, Sundays and Public Holidays

Ride Id:	Trip:	Consist:
10007	WN11	2N
10003	WN12	2N
10008	WN15	2N
10004	WN16	2N
10005	WN17	2N
10006	WN17	2N
10009	WN18	2N
10010	WN18	2N
10011	WN18	2N

North Coast services	North West services	West and Broken Hill services	Canberra services	Griffith services	Melbourne services
Trip:	Trip:	Trip:	Trip:	Trip:	Trip:
NT33	NP23	WT27	SP31	SP41	ST23
NT35	NP43	WP45	SP33	SP41	ST21
NT31	NP24	WT28	SP35		ST22
NT34	NP44	WP46	SP32		ST24
NT36			SP34		
NT32			SP36		