# Bus Reliability and Punctuality Performance

## Recommendation(s)

That the Board:

i. Notes the changes to the reporting of bus reliability and punctuality. As at July 2014 the reporting of actual performance against schedules is by Auckland Transport generated GPS-tracking data, not self-reporting by operators.

ii. Notes the programme of regular reviews of timetable run-times and timetable upgrades developed jointly between AT and bus operators, to further improve bus reliability and punctuality using actual on-the-ground run-times.

## Executive summary

A PT strategic priority is to improve the reliability and punctuality of services. A programme of work is progressing with bus operators to improve bus service reliability and punctuality:

(a) GPS-tracking of buses with real-time monitoring, and reporting; and

(b) Timetable run-time review and upgrade to build and continuously improve services.

Under existing contracts, bus operators provided AT with a monthly service delivery report. Two main variants of contract exist: 'North Auckland Spine' (~5% of services), and the remainder (~70% of services). Commercial services (~25% services) are exempt from performance reporting. The majority of contracts reported contracted performance rather than actual customer experience, i.e. excluded trips where performance was impacted by factors outside of operator control e.g. adverse weather, exceptional passenger loadings and significant traffic congestion, resulting in artificially high performance reports. Various metrics were used including reliability at within 30 minutes of start of trip.

Reliability and punctuality has been predominantly monitored through manual self-reporting systems. AT has been working with operators to transition to an automated system based on actual performance data generated from new GPS-tracking equipment. Reporting reliability and punctuality using GPS-tracked performance data will commence from 1 July.

New and consistent, PTOM KPIs will be reported - reliability (trips started within 10 minutes of schedule and completed) and punctuality (trips started within 5 minutes of schedule). In future punctuality at points through the trip and at the final destination will also be measured. This new methodology reports on customer experience with no exclusions or exemptions such as congestion or adverse weather. An expected punctuality is 100% at start of first each duty timetable trip (operator reaching the trip start) and for all other trips, allowing for an element of average statistical non-performance from outlying high congestion, poor weather, accidents, etc, and compounded where successive trips are linked, 95% at trip start for non-right-of-way (mixed with traffic) and 98% for right-of-way (busway) services.

As a result of no exceptions, the GPS-tracked reliability and punctuality will be lower than previously reported, however performance data collected will permit improvements in service delivery through an ongoing iterative programme of six to twelve monthly timetable reviews.

An improvement in punctuality has been realised across the network rising from 82.7% to 90.53% punctuality between December 2013 and July 2014. 3 August West Auckland

timetable changes have seen initial punctuality improvement to 95%. Further timetable reviews over the next 12 months will raise network performance towards PTOM levels.

## Strategic context

On-time performance is a PT key strategic priority to improve the reliability and punctuality performance of PT services, identified in the RPTP as a key change driver and specifically referenced under policies 4.1 (develop realistic, achievable timetables that are reliable and dependable), 4.3 (provide a reliable, punctual, customer focused network of services) and 4.6 monitor and continuously improve service delivery). Reliable and punctual services are a significant driver of customer satisfaction and patronage growth.

## Background

Historically the monthly bus service reliability and punctuality statistics have been based on operator self-reporting and based on predominant manual reporting systems. Within existing contracts, operators can exempt trips that failed based on agreed circumstances including adverse weather or significant traffic congestion. This is not aligned to customer experience.

Furthermore, there has been insufficient real-time trip data to improve run-time estimation for sectors across a trip that in turn can be used to calculate accurate whole trip run-times.

As part of the AIFS modifications to buses from late 2013 through to March 2014, Auckland Transport has installed new AVL GPS-tracking units. Tracking data is used within the EDW to measure and report on performance against trip sectors within published timetables.

Auckland Transport has been partnering with operators over the past 6 to 12 months to review all timetables using this new accurate run-time data to target new PTOM reliability and punctuality metrics and targets. All trips are measured, irrespective of performance or the reason for poor performance to ensure statistics reflect actual customer experience.

## Issues and options

New PTOM contracts will consolidate KPIs for reliability, punctuality at the start of each trip and punctuality at intermediate timing points. At present there are different KPIs amongst historic contracts and do not exist for commercial services. These new KPIs have been adopted by Auckland Transport and operators as the target for re-engineered timetables.

The PTOM KPI for reliability is defined as the service sighted in the real-time system (noting that some trips may not register in the system, e.g. due to driver log-in error but still operate), and departs from the start of the trip between -59 seconds and +9 minutes 59 seconds of schedule. For PTOM expected delivery is 100%, with no payment for trips not delivered between 100% and 98% and financial deductions for performance less than 98%. The historic KPI varied between contracts but was as much as 30 minutes after schedule.

The PTOM KPI for punctuality at the start of each trip is defined as the service departs the start of trip within -59 seconds or +4 minutes 59 seconds of schedule. For PTOM expected delivery is 100% for first trip of each duty timetable, 98% for right-of-way Rapid Transit services and an average of 95% for non-right-of-way services for trips other than first trip of each duty timetable; 95% reflects an average to account for changing congestion, poor weather and other trip linkages through the day with no exceptions. Performance above and below this will be subject to financial bonus or deductions.

PTOM Metrics account for the on-road operating environment and accommodate operator-not-at-fault incidents as part of the PTOM draft KPIs, for example unexpected congestion.

This targets metrics as experienced by the customer compared to the historic reporting that excluded poor performance outside the operator control.

These definitions align with NZTA national requirements and compares favourably to many other cities (attachment 1).

For punctuality, the emphasis has been placed on the initial point of departure as this is the key determinant of success or failure for the rest of the trip. Auckland Transport has started measuring punctuality at timing points and at trip destination also.

Auckland Transport and operators have been working together on the substantial task of reviewing, using the new methodology of sector run-time review with actual on-road performance measurements, to iteratively re-engineer every service trip in Auckland bus timetables towards PTOM KPIs. The programme to date has resulted in the following changes to timetables for customers:

| Area/Depot | Target Date |
|---|---|
| East Coast Road | 5 Aug 13 |
| Hibiscus Coast | 25 Aug 13 |
| Te Atatu, Waitakere, Glen Eden, Otara, New North Road | 13 Oct 13 |
| Newmarket, Mt Eden Road, Dominion Road, Sandringham Road, Manukau Road, Great South Road, | 9 Feb 14 |
| West Auckland, including Titirangi New Network | 3 Aug 2014 |

Timetables will be reviewed on an ongoing basis as run-times and congestion changes:

| Area/Depot | Target Date |
|---|---|
| Glenfield Depot/ North Star | Oct 2014 |
| Orewa Depot / North Star | Feb 2015 |
| Metro Link - Inner (including Links) | Nov 2014 |
| Metro Link - Outer | Nov 2014 |
| Howick & Eastern | Nov 2014 |
| Ritchies (West and North) | Feb 2015 |
| Birkenhead Transport | Jun 2015 |
| Tranzit | Oct 2014 |
| Waka Pacific /South Auckland New Network | Sep 2015 |
| HBC including NEX extension | May 2015 |

## Customer impact

Customer satisfaction surveys have identified that bus punctuality is a key issue for customers. In December 2013, Auckland Transport received 214 complaints on this subject; by July 2014, this had dropped to 155 – a 28% reduction. Customers will notice on-going improvements in operational delivery as a result of this change. It is planned that every timetable will be reviewed every 12 months in order to ensure an appropriate level of punctuality in light of changeable levels of traffic congestion and changes to the roading environment introduced through bus prioritisation measures for example.

## Reliability results

The reliability results for July 2014 for the bus network compared to December 2013:

| Operator | Dec 13 | July 14 | Improvement | Provision of Service |
|---|---|---|---|---|
| NZ Bus | 94.24% | 96.66% | 2.42% | 60% |
| Ritchies | 95.63% | 97.29% | 1.66% | 16.4% |
| Howick & Eastern | 96.91% | 93.28% | -3.63% | 10.2% |
| Birkenhead Transport | 98.73% | 95.09% | -3.64% | 6.2% |
| Urban Express | 96.01% | 96.40% | 0.39% | 3.2% |
| Airbus Express | 95.02% | 89.33% | -5.69% | 3% |
| Tranzit | 96.53% | 93.79% | -2.74% | <1% |
| Waiheke Bus Company | Not measured | 93.84% | NA | <1% |
| **TOTAL** | **94.91%** | **96.14%** | **1.23%** | **100%** |

## Punctuality results

The reporting of punctuality has changed in methodology. Currently, operators report only those trips for which there is no contractually exempted justification (such as adverse traffic conditions or extreme passenger loading). The new methodology reports what customers actually experience.

Research shows that the punctuality measure adopted by Auckland Transport is at the upper end of standards in other cities (attachment 1). Over the past 8 months, the network's punctuality has risen from 82.71% in December 2013 to 90.53% in July 2014, an increase of 7.82% with no exceptions for poor weather, congestion etc. For comparison between 2006 and 2009 the average on-time departures in Norfolk, UK rose from 81.36% to 88.77% (an increase of 7.41% over 3 years) and is cited by Department for Transport as a good case study[1]. In London, between 2011/12 and 2013/14, performance deteriorated from 83.2% to 82.5% for Low Frequency Services and from 86.3% to 82.8% for High Frequency Services[2].

The punctuality results for July 2014 for the bus network compared to December 2013:

| Operator | Dec 13 | July 14 | Improvement | Provision of Service |
|---|---|---|---|---|
| NZ Bus | 81.91% | 91.62% | 9.71% | 60% |
| Ritchies | 90.85% | 93.39% | 2.54% | 16.4% |
| Howick & Eastern | 86.94% | 82.28% | -4.66% | 10.2% |
| Birkenhead Transport | 83.92% | 90.41% | 6.49% | 6.2% |
| Urban Express | 86.13% | 91.90% | 5.77% | 3.2% |
| Airbus Express | 68.37% | 75.06% | 6.69% | 3% |
| Tranzit | 87.37% | 87.11% | -0.26% | <1% |
| Waiheke Bus Company | Not measured | 84.43% | NZ | <1% |
| **TOTAL** | **82.71%** | **90.53%** | **7.82%** | **100%** |

Punctuality performance between December 2013 and July 2014 and performance compared to previous operator self-reporting to June 2014 is illustrated in Figure 1.

[1] http://webarchive.nationalarchives.gov.uk/20111005180132/http://assets.dft.gov.uk/publications/bus-punctuality-partnerships-guidance/bus-punctuality-partnerships-guidance.pdf (page 16, Para 3.8)
[2] https://www.tfl.gov.uk/cdn/static/cms/documents/annual-performance-summary.pdf page 1

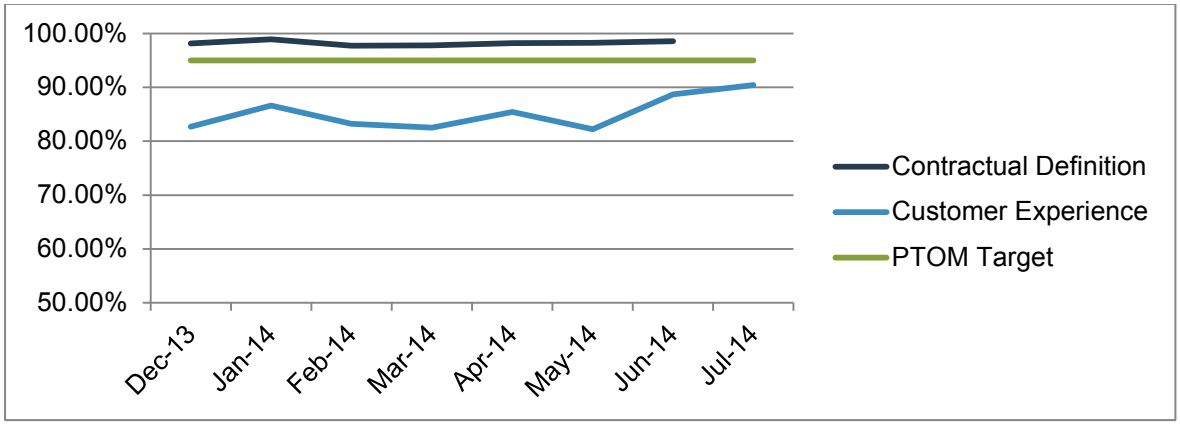


***Figure 1: bus network punctuality performance***

## Next steps

All future monthly bus reliability and punctuality statistics will be based on Auckland Transport generated GPS-tracking performance data.

The on-going programme of timetable reviews will further drive reliability and punctuality performance.

## Document ownership

| | | |
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## Glossary

| Acronym | Description |
|---|---|
| AIFS | Auckland Integrated Fares Scheme |
| AVL | Automatic Vehicle Locator |
| EDW | Enterprise Data Warehouse. |
| GPS | Global Positioning System |
| PTOM | Public Transport Operating Model |
| RPTP | Regional Public Transport Plan 2013 |

**Attachment 1 - Examples of International and National Service Delivery Targets**

| Jurisdiction | Definition | KPI |
|---|---|---|
| Melbourne | -0:59 early or 5:59 late | Punctuality: 70% |
| MBTA (Boston) | 2:00 early – 5:00 late | 75% on time for headways less than 10 minutes; 85% on headways above 10 minutes.<br>65% for peak travel times.<br>95% for Bus Rapid Transit. |
| SEPTA (Philadelphia) | 0 – 5:00 late | 75% on time for headways less than 10 minutes during the peak; 85% on headways above 10 minutes during the peak.<br>80% during non-peak for headways less than 10 minutes; 95% during non-peak for headways more than 10 minutes. |
| SMBSC Sydney | Timetabled route: -1:59 early – 5:59 late.<br>Headway route: within 5:59 of published headway. | 95% of timetable trips and headway trips are On Time.<br>95% of timetable trips and headway trips leave the mid-point transit stop On Time.<br><5% of Published Timetable Trips arrive at the last Transit Stop of each trip Late. |
| Perth | 0:00 – 4:00. | 85% of services |
| Palm Tran (West Palm Beach) | - 1:00 early – 5:00 late | 90% on time during peak; 95% other times |
| FTA (Florida) | 0 – 5:00 late | 80% on time for headways less than 10 minutes; 95% on headways above 10 minutes.<br>Peak service is 75% for headways less than 10 minutes; 85% for headways above 10 minutes. |
| VIA Transit (San Antonio) | 0 – 5:00 late. Trips arriving :30 early will be considered on time only if they don't depart before schedule. | 95% measured at end of the line points; 90% at transfer points; all other points 85%. |
| Valley Metro (Phoenix) | 0 – 5:00 late | 95% of sampled trips on time. |
| Milwaukee County TDP | 1:00 early – 3:00 late | 90% on time. |
| ACT - ACTION | -1:00 early – 4:00 measured at trip departure stop, which is a designated timing point | 85% |
| Wellington | 0 – 10:00 | 90% (at start of trip) |