

# The Limitations of Data-Only Services for Transport Providers

---

White Paper

**CONTENTS**

**Summary** .....03

**Introduction** .....03

**Benefits of voice**.....03

    Normal operations .....03

    Night or operating in dangerous neighborhoods..... 04

    During emergencies/crises ..... 04

**Technology comparison**.....05

**Conclusion**..... 06

**General terms of use for Tait technical documentation.** While Tait has taken every care to ensure that the information and contents are correct and up-to-date at the time of printing, the information may contain technical inaccuracies and/or printing errors. Tait does not guarantee the accuracy or correctness of the information. Tait cannot be held liable or responsible for errors or omissions in the contents of the technical documentation. All information contained in the technical documentation is given without warranties or representations, expressed or implied.

**Disclaimer.** Tait Limited marketed under the Tait Communications brand. Tait Limited expressly disclaims all warranties, expressed or implied, including but not limited to implied warranties as to the accuracy of the contents of this document. In no event shall Tait Limited be liable for any injury, expenses, profits, loss or damage, direct, incidental, or consequential, or any other pecuniary loss arising out of the use of or reliance on the information described in this document.

**Copyright © 2012 Tait Limited.**

## SUMMARY

Over the last few years, increasing amounts of information in the form of data is being transferred to and from public transport vehicles. This has led to some data-only communications services that no longer provide voice. The main reason for this appears to be a combination of cost reduction and a perception that voice contact is no longer needed. In most of these cases the only voice service is provided by the use of the driver's cellular telephone. So is there still a need for voice communications in public transport operations? To answer this question this paper considers some of the benefits of providing such a service. What options could be considered? This paper also compares two technologies that could be considered for the provision of a voice service.

## INTRODUCTION

Recently several systems have been provided to support communications to and from transport fleet vehicles using only data. These data systems support many of the operators needs in terms of driver log on/off, timetable compliance, passenger counting, etc. However some of these services do not support voice thus raising the question as to whether voice is still even required in public transport operations.

As a line of last resort, many drivers (and also the operator) rely on their personal cellular telephones.

To address the question raised by this paper consideration is given to the benefits of having voice communications as compared to data only. No consideration is given to replacing data with voice. The point is to raise the awareness of using voice along with data.

## BENEFITS OF VOICE

Voice communications continue to offer the most versatile and immediate method of exchanging information from one human to another. Language barriers, literacy, disabilities can make the use of terminal (Man Machine Interface) based equipment difficult. This becomes especially hard during times of stress or in emergencies. At these times, people can become incapable of operating an MMI and will readily resort to speech if at all possible. Consider the problems involved in describing a critical situation quickly using text on your own cellular telephone.

## NORMAL OPERATIONS

With the continuing debate about driver distraction, voice services from the dispatch or operations centre to the vehicle, pose a lower risk to the driver. This is similar to listening to a music CD or broadcast radio while driving. Listening to such a voice message does not distract the driver's most important sense which is vision.

On the other hand viewing a message received on a mobile terminal whilst moving and driving is acknowledged as being hazardous. This is further reinforced with legislation in many countries coming down against cellular telephones where

sending or receiving of text messages is not permitted while driving. The following table T.1 describes some typical example messages where voice would be used.

MESSAGE TYPE	TYPICAL FORM	LENGTH IF READ
<b>Service disruption</b>	“A water main has fractured in the High Street. All Service 6 buses are to divert into Hope Street, then into Better Place and back onto High Street via Good Road.”	9 seconds
<b>Lost property</b>	“Has any Service 12 vehicle had a black wallet handed in?”	3 seconds
<b>Service problem</b>	“Bus 123 you are running 7 minutes behind schedule. Do you have a problem?”	4 seconds

The examples in the table indicate the types of messages that can be sent to the vehicles, sending these messages by voice will reduce the driver distraction. Some jurisdictions do not allow viewing of any text or images in vehicles by the driver while in motion. If the vehicle does not stop for some time, viewing the message could be delayed to such an extent as value is lost. Even if voice is used, these messages can still be sent to the mobile data terminal for viewing when the vehicle is not moving.

### NIGHT OR OPERATING IN DANGEROUS NEIGHBORHOODS

During night operation or when in a dangerous neighborhood, operators of data-only services (UK road rescue operators) have reported that drivers have called in from time to time to confirm that a person is there in case they need help. Often, this is done using their personal cellular telephone. In another similar case, taxi drivers using a data system wanted to hear the data message traffic just to confirm everything was working. Such “trust issues” over a feeling of remoteness may lead to poor driver morale and may cause otherwise good drivers to leave the operator.

### DURING EMERGENCIES/CRISES

During an incident or emergency, help or advice is often sought by the driver. In such a stressful situation, it is hard for a driver to use an MMI to express the problem and wait for a text-based response.

Voice conveys information at several levels including a measure of the degree of pressure the individual is under and how the individual is coping. Background noise might provide other clues. None of this is easily identified when text is involved. Voice also has the advantage of being configurable (in advance) to allow the driver to talk whilst fending off an assailant. Following a road traffic accident, coaching may be required by the dispatch staff to assist the driver through the process to be followed.

Again this is best achieved by voice where the calming effect of another human voice cannot be underestimated.

Experience suggests that during major crises, voice may be the last line of communications. This can be the case where infrastructure is affected and only direct communications remain, perhaps only on a vehicle-to-vehicle basis. During such situations, cellular telephone networks are subject to overload and, in many cases if extreme weather events occur, infrastructure is compromised. Individual cellular telephones offer no prospect of useful direct communications. However mobile radio still offers ranges of up to several kilometers. Messages during such times of crisis are often unclear and may have wide ranging content. In such situations, voice has proved to be the most versatile and immediate medium for message transfer.

### TECHNOLOGY COMPARISON

Many would agree that voice still offers some unique advantages, however deciding on the most appropriate technology can be an issue. Wide area wireless voice services continue to be dominated by two technologies – cellular and mobile radio. The table T.2 below describes some of the benefits each offers.

MESSAGE TYPE	DESTINATION	CELLULAR	MOBILE RADIO
<b>Broadcast call - to all vehicles at once</b>	All drivers	Not supported	Standard feature
<b>Group call - to a limited group</b>	Route, area etc	Limited support	Standard feature
<b>Individual call</b>	To a specific vehicle or driver	Standard feature	Standard feature
<b>Emergency call handling</b>	Dispatch from individual machine	Custom feature	Standard feature
<b>Voice call without infrastructure</b>	Broadcast vehicle to vehicle	Not supported	Customer feature

From this table it can be seen that mobile radio continues to be the most versatile. Many transport operators expect both voice and data communications services to be available for at least 99.99% of the time. This quality of service level is rarely guaranteed by third party service operators (cellular providers) and if it is, extra investment is required.

On the other hand mobile radio systems can be designed to provide this quality of service from the onset.

## CONCLUSION

Data still plays a vital role in the delivery of public transport operations and this can be provided by either cellular or mobile radio. However public transport operators encounter many situations where the best considered and deployed data services do not address all of their operational needs. When considering a comprehensive communications solution that will meet a wide range of operational needs voice services need to be included. As has been described voice really comes into its own when operational issues arise, such as disruptions, breakdowns, emergencies or crises. To determine the value of deploying a voice service, operators should consider a range of operational scenarios and how these would be best addressed either by data or by voice. In many cases it will be found that the most urgent needs will be best managed by voice.

Author: John A. Graham  
[www.taitradio.com](http://www.taitradio.com)