UITP ADVANCING PUBLIC TRANSPORT

MAY 2014

ACTION POINTS

FOR THE PUBLIC TRANSPORT SECTOR

THE BENEFITS OF OPEN DATA

SUMMARY

- Transport organisations across the world are facing growing public demand to provide Open Data. UITP believes that all transport organisations should respond positively to this.
- Many transport organisations have already responded by making data openly available to application developers, often free of charge and with very few or no restrictions.
- This is driving a rapid increase in the number of travel information products for customers to help them undertake and improve their journeys more conveniently.
- There are many benefits of this for customers and for transport organisations, but there are some challenges that need to be overcome in terms of policy and operational arrangements.
- This means that all transport organisations need to establish clear policies and procedures to respond positively to this demand, taking into account their own local circumstances.

THE SCOPE

The UITP Information Technology & Innovation Commission has prepared this paper to set the overall direction of our industry in the light of rapid developments in the field of Open Data. The paper takes stock of how transport organisations all over the world have responded to Open Data and captured tangible economic and other benefits that are being felt by customers and transport organisations.

The paper is written primarily from the perspective of the benefits to customers because, either directly through fares or indirectly through taxation or other public funding, the public pays for the services we provide. This means that the paper draws no distinction between public and private transport operators because users of transport make no such distinction themselves.

MAIN MESSAGE

All transport organisations must be proactive in supporting the provision of Open Data because of the benefits this brings to the customers we serve. In light of such proactive support, there should be no need for any further action by regulators or legislators in the transport sector.

In many ways, the global transport industry is at the forefront of embracing the provision of free Open Data, as is seen in the rapid increase in products appearing on the market. There is now *indisputable* evidence from different countries showing that the provision of free and Open Data delivers net benefits.

UITP believes that the global transport sector should be proactive in supporting the provision of Open Data, preferably on a cost-free basis and with limited or no restrictions.

INTRODUCTION

There is increasing demand from the public for the best transit system possible. With advances in technology and social media, **the expectations of our customers are constantly increasing**.

To **meet these rising expectations**, transport organisations *benchmark* their services against those of other organisations of similar size and scale. This allows organisations to compare performances and share best practices. Organisations have typically used '**data**', *the new raw material of this century*, to do this.

But now there is **a new and powerful global trend** involving data. There is growing demand from the public for access to free **Open Data** to help them make easier journeys and to hold transport organisations to account. This is the phenomenon called 'Open Data'.

WHAT IS OPEN DATA?

Open Data is the idea that certain data should be made available to everyone to use and republish as they wish, with no or very limited restrictions from copyright, patents or other controls.

According to the Open Definition Organisation "a piece of data is open if anyone is free to use, reuse and redistribute it – subject only, at most, to the requirement to attribute and/or share alike."

Open Data is making information from an organisation available to all by sharing it on the web, often free of charge[1] and with very few, if any, restrictions placed on all sides.

To be considered 'Open Data', the data must meet **three basic requirements**: be *accessible*, be in a digital *machine readable* format and be virtually *free of restriction* on use or redistribution[2]. However, in general, there is no limit (besides the exceptions mentioned hereafter) of what can be regarded as Open Data.

In **the context of transport**, Open Data tends to refer to **dynamic real-time service status** information (e.g. time of arrival and departure, service disruption, position of vehicles, delays and status of elevators, escalators), **location** of stations and stops (train, tram or bus), planned **schedules**, **fare products** and **price structure**.

There are **multiple reasons why this is made available** in the transport sector, including:

- **stimulating efficiency and innovation** in information provision by allowing application developers to deliver information products to the public, **extending the reach of information** beyond that which could be achieved by transport organisations alone;
- **ensuring openness and transparency** in the operation of transport services which is of increasing importance to the

public who, either directly or indirectly, pay for transport services and want to see **value for money** delivered;

- helping further develop the concept of **'Smarter Cities'** where social and environmental factors are demanding a more *integrated approach to data and urban transport provision*;
- **allowing competitors** to have access to reliable data so that they can better compete with the data owner's services; and
- **stimulating jobs** in the technology sector.

There also remains interest in other forms of data such as *financial and retrospective operational data* (e.g. service performance and customer satisfaction). However, this tends to be for the public scrutiny of business performance.

The key focus of Open Data in the context of this paper is to help customers and users undertake better and more 'personalised' journeys and to avoid the impacts of unexpected disruption.

WHAT IS NOT OPEN DATA?

Finally, great care needs to be taken to define what information is capable of being shared in an open way since there are **a number of classes of information** that it would not be appropriate to share publicly. Examples include:

- **Personal information about passengers** (e.g. personal travel histories, contact details or financial information);
- Information formally 'classified' as genuinely **sensitive or confidential** (e.g. for security or real commercial reasons); and
- Data where the **copyright** is contractually owned by a third party.

It is usually very straightforward to draw a distinction between the data that should be shared and the data that should not be shared.

THE NEED TO BE PROACTIVE!

The population has a *great desire to create applications* and web services. It increasingly regards these data as their own and not the property of transport organisations. The reality is that, if public transport does not proactively follow this trend, then individuals will fill the gap. Giving the public the task of putting data online leaves a danger that it may not be reliable. Therefore, **it is imperative for public transport to take the lead in sharing their data sets**.

Third Party applications, web services and tools, can help customers make their journeys *even better* and this reflects well also on the actual public transport service providers.

Social media in applications will allow the public to comment on services. This helps to target interventions that transit companies may use to improve the users' experience.

Crowdsourcing applications where people enter real-time feedback about operational status can also provide avenues for service improvements. This type of information is only likely to grow given the rapid development of social media.

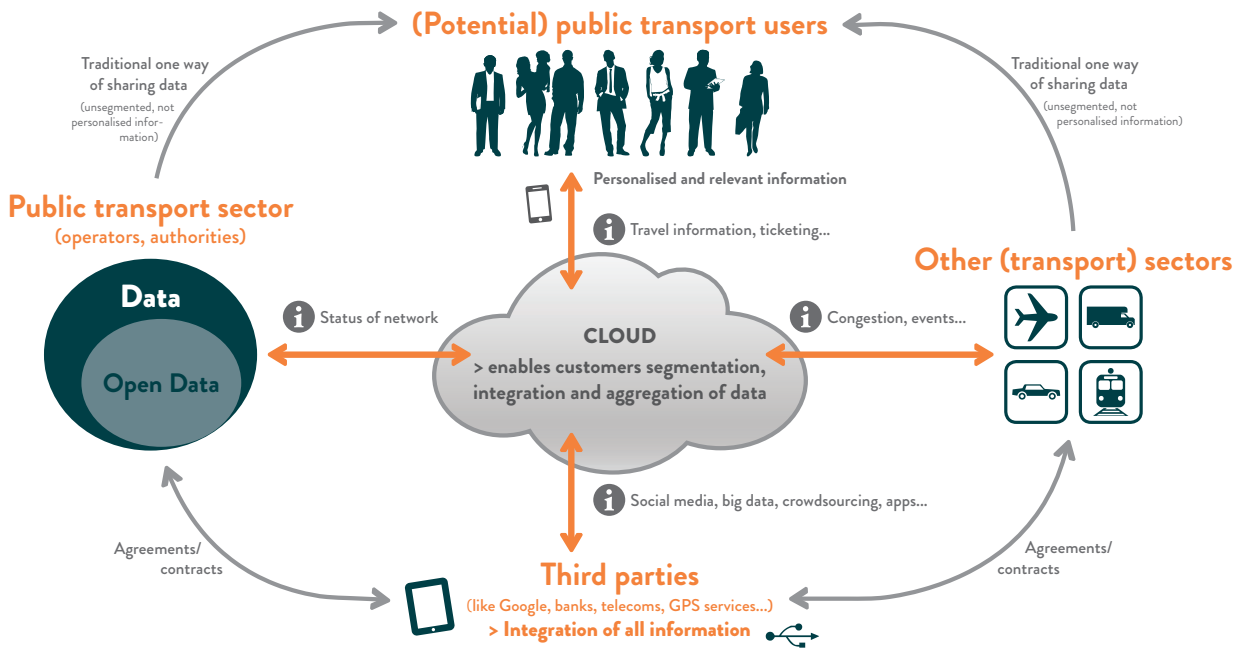
Transport organisations should be proactive in grasping these new opportunities.

OPEN DATA IN ACTION

Many Transport organisations **are now routinely providing data sets** that enable application developers to provide new information services for mobile devices such as *Apple*, *Android*, *Windows* or *Blackberry*. This is also helping to **demonstrate greater transparency** to fare and tax payers, politicians and others who scrutinise their performance. It helps **bolster reputation** because there is a close *correlation between providing high quality transport information and high customer satisfaction*.

- The Open Data feeds of **Transport for London**, which over 5,000 developers have registered to use free of charge, has produced hundreds of apps on all platforms, used by millions of people and covering roads and all modes of

OVERVIEW OF OPEN DATA IN PUBLIC TRANSPORT



Who benefits?

Public transport users

(better journey experience)

- More personalised **info**, whenever, wherever
- Save **time** thanks to smarter planning
- Save **money** as better informed
- By avoiding disruption = **better journey**

Public transport sector

(more efficient operation)

- Extend reach of info = **more passengers**
- **Savings** as third parties develop apps
- Better informed passengers = better use of **network** capacity
- Enhanced **image** (openness and transparency)

Economy

(benefits of a new big market)

- More **innovation** and competition
- Generation of skilled **employment**
- New **business** opportunities for third parties and developers

public transport including buses, metro, cycle hire and many more.

- **EMT in Madrid** has a well-established free, Open Data policy and platform and regards Open Data as essential as part of building a 'Smart City'. This draws together information on all modes and enables links to be made to other elements of what makes a city work – e.g. traffic, controlled parking and waste management.
- The Open Data of **Rennes Métropole** has facilitated nearly 40 free applications and services and the most popular, developed on the Android platform, provides directly on mobile phone bus and metro timetables, can calculate the best route, locate bus stops nearby and view the availability of bike stations[3].

The public can quickly obtain **a variety of applications and multi-modal information**, often free of charge, to guide them in the use of public transport, *especially at times of unexpected disruption*. They will have the ability to choose the tools that most suit their **personal needs**, often enabling them to 'personalise' information even when using mass transit with millions of others. This '**personalisation**' helps increase customer satisfaction with transport services and allows operators to present a *more 'human' face*.

Third Parties *can be considered a* 'partner' too. Many transport organisations actively support their developer community and engage in **co-development**. Only the most accurate and reliable applications will survive because competition and personal choice mean that **unreliable applications tend to disappear**. There is no evidence to suggest that apps developed by third parties are inherently unreliable.

It is crucial to provide third parties with high quality, accurate and authoritative information sources from transport organisations (avoid: "garbage in, garbage out").

Cost / Benefit *ratios have only started to crystallise recently but* where authorities such as Transport for London and Västtrafik in Sweden pursue Open Data in preference to developing their own apps, they have **avoided the considerable costs of building applications** themselves while extending the reach of their information.

More concretely, in a Deloitte study commissioned as part of the UK Department for Business Innovation and Skills, **the customer time saved** through Transport for London's approach have saved customers up £58m per annum[4].

A further reason to provide Open Data is to **stimulate the growth of small and medium enterprises**, which in turn creates highly skilled jobs and tax revenue. Many of the application developers are small independent individuals or companies.

HOW OPEN DATA IS MADE AVAILABLE

Open Data must be made available on the web in an easily accessible location and in an easy format for developers to read.

Several formats are available, including: TCIP (Transit Communication Interface Profiles), GTFS (General Transit Feed Specification), Excel, XML, JSON, SIRI, CSV or XSD.

Data are also now being shared more broadly through '**application programming interfaces**', or API's, which specify how software components should interact with each other. Making data available through API's makes it easier for developers to take transport data and manipulate it into products for the public.

There are several ways of **making data accessible**: by direct deposit on the web, using a web service, an agency (metropolitan, provincial or federal) or through a government agency.

More and more providers of Open Data advocate **a more integrated approach**, such as a metropolitan or provincial agency, in order to have transportation data from a higher scale, and thus encourage applications covering more than one Transit Company, and create synergies between them – e.g. joining up a city bus data with its metro service data.

Data must be relevant, up-to-date, reliable, easy to use, high quality, and reusable.

To this end, Sir Tim Berners-Lee proposed a *five-star scheme for assessing the degree of re-usability of a dataset*, as recommend by the UK Open Data white paper – Unleashing the potential[5]:

A five-star data set will be easier to use than a one-star set. *Public transport organisations must decide to what level they want to engage* in assessing the benefits and return of investment for each level.

Finally, *transport organisations need to decide what conditions they will place on how their data are used*. Some will want to see use framed by conventions while others will wish to apply no or only very limited restrictions. Whichever is the case, transport organisations must be prepared to explain their approach publicly and transparently.

CHARGING FOR OPEN DATA

While more and more transport organisations are making their data **openly available free of charge**, others describe their approach as 'semi-open' in the sense that, for example, they **prohibit or place license restrictions on the re-distribution** of the data they make available. Some, usually private sector organisations delivering services under government franchise or other arrangements, **charge a fee to third parties**.

This can be a controversial area since *developers and others interested* in re-using these data do not differentiate between public and private sectors in just the same way as *customers* themselves make no distinction.

There is also emerging evidence that **innovation and competition is stifled** *by charging or by placing significant license restrictions* since small developers and other players may not be in a position to pay or might not be able or willing to meet contractual restrictions.

Transport organisations who do charge or who do place commercial or other restrictions on Open Data need to **be prepared to explain the approach publicly** and transparently.

In general, charging for Open Data results in the exclusion from enjoying the benefits.

REGULATION

Many countries (e.g. UK, NO, SE, FI, DK, etc) are adopting **favourable regulations** in order to ensure that all (and not only the major PT operators) respond positively and promptly to Open Data deployment. In some countries, transport companies do not have the choice to opt for Open Data but are being forced to do so by law or government policy!

In Europe, the European Commission consultation paper 'Access to multimodal traffic and travel data in the European Union' strongly suggests a preference for making data widely available 'to all market players and public authorities'[6].

Proactive support from the sector should prevent any further action by regulators or legislators.

UITP strongly supports the bottom-up approach and suggests that Open Data is best regulated through the existing local (concession) agreements between transport authorities and public transport operators. This will answer to the principle of subsidiarity (local demands, needs and possibilities) and gives room to aim to go beyond minimum requirements.

★	Available on the web (whatever format) but with an open licence, to be Open Data
★★	Available as machine-readable structured data (e.g. excel instead of image scan of a table)
★★★	as (★★) plus non-proprietary format (e.g. CSV instead of excel)
★★★★	All the above plus, use URLs (Uniform Resource Locator) to identify things using open standards and recommendation from W3C (RDF and SPARQL), so that people can point at your stuff
★★★★★	All the above, plus: link your data to other people's data to provide context

THE OBSTACLES ARE FEW

Best practices experience has shown that there are several factors contributing to its success. True commitment to Open Data does take time but the benefits will greatly outnumber costs and disadvantages.

- The **decision making process** needs to also **take into account benefits falling to others** such as time saved by the public.
- Today, very much depends on existing contracts in place. As **Open Data is a recent phenomenon**, long-lasting contracts are not necessarily adapted yet to this new reality. To remedy this, it may be required to **review the existing contracts**.
- It is very easy for organisations to decide on the **Ownership of Data**. In some cases, e.g. when private firms are used for the delivery of certain services, they may, for 'commercial' reasons, be reluctant to make the data openly available. Clear explanations and possibly agreements will solve most of these issues.
- **License agreements** and **charging for data** are difficult areas. Moreover, the benefits will most likely outweigh the efforts to protect your Open Data. Unduly onerous arrangements can restrict the take-up and thus **stifle innovation and competition**.
- **Engagement with developers** and other players takes time – e.g. events such as 'Hackethons' (competitions for programmers) to develop products and fill gaps in the market[7].

It is up to each transport organisation to weigh up these challenges against the benefits of an Open Data approach and to explain their position publicly and transparently.

CONCLUSIONS

Open Data

- The key focus of Open Data is to help users undertake better and more 'personalised' journeys and to avoid the impact of unexpected disruptions.
- Open Data is driving a rapid increase in the number of travel information products for customers to help them undertake their journeys.
- Open Data is making information from an organisation available to all by sharing it on the web, often free of charge[1] and with very few, if any, restrictions placed on all sides.
- Open Data must be relevant, up-to-date, reliable, easy to use, high quality, and reusable. It tends to refer to dynamic real-time service status information, location of stations and stops (train, tram or bus), planned schedule, fare products and price structure.
- Open Data is not: personal information about passengers, sensitive, confidential or data which is subject to copyright. It is usually very straightforward to draw a distinction between the data that should be shared and the data that should not be shared.
- Open Data' must meet three basic requirements: be accessible, be in a digital machine readable format and be virtually free of restrictions on use or redistribution.
- In general, charging for Open Data results in the exclusion from enjoying the benefits.

Public transport organisations

- It is imperative for public transport to take the lead in sharing data sets, or others will provide so.
- Transport organisations should be proactive (connecting to third parties, utilising social media and crowdsourcing applications, become transparent, and grab the new opportunities).
- Open Data requires that all transport organisations need to establish clear policies and procedures to respond positively to this demand taking into account their own local circumstances.
- Public transport organisations must decide to what level they want to engage in and what conditions they will place on how their data are used.
- They should make their approach transparent to the public.

- Moving to Open Data provision is not always an easy journey. Some of the reluctance to embrace it can be driven by the fact that *hard financial benefits* are not always readily identifiable in advance of making the data available.
- In addition, considerations around the perceived *'commercial sensitivity'* of data in competitive markets and the cost of providing reliable Open Data can also influence the position organisations take.

List of footnotes

1 According to "iTS.be – Licence Models – Best practice checklist" from A. Reyers 80, B-1030 Brussels, they advise to consider not to charge for the data, as this drives small but creative users out of the market and the beneficial effects of enabled services are likely to be much higher than the revenue generated by charging for the data. An interesting model could be to charge high volume users with special requests (in essence the basic use of data is free, but additional services are paying).

2 From the following article: www.cabinetoffice.gov.uk/resource-library/open-data-white-paper-unleashing-potential

3 From the article "Open Data, les transports publics libèrent leurs données" of TRANSPORT PUBLIC magazine – June 2012 – nº 1125

4 For more information see www.gov.uk/government/publications/public-sector-information-market-assessment

5 See these links: www.w3.org/DesignIssues/LinkedData.html www.cabinetoffice.gov.uk/resource-library/open-data-white-paper-unleashing-potential

6 See this link: http://ec.europa.eu/transport/media/consultation/consultations/doc/2013

7 For example, see those following links: www.hacktaville.ca or http://apps4norge.no

8 This position is supported by the results of a recent survey carried out by the Information Technology and Innovation Commission.

RECOMMENDATION[8]

In many ways, the global transport industry is at the forefront of embracing the provision of free Open Data, as is seen in the rapid increase in products appearing on the market. There is now indisputable evidence from different countries showing that the provision of Open Data delivers net benefits:

- to customers and users by improving their journey experience, saving them time through information services delivered by developers; and
- to transport organisations by enabling them to operate more efficiently while demonstrating openness and transparency to those who, directly or indirectly, fund them.

Under these circumstances, and given the increasing global public demand for more and more information to be made publicly available in all walks of life (e.g. health and education), UITP believes that the global transport sector should be proactive in supporting the provision of Open Data, preferably on a cost free basis and with limited restrictions.

This document is a set of recommendations for the public transport sector published by the International Association of Public Transport. UITP has over 1,300 member companies in 92 countries throughout the world and represents the interests of key players in this sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport world-wide.

These Action Points were prepared by the Information Technology and Innovation Commission.

Rue Sainte-Marie 6, B-1080 Brussels | Belgium | **Tel** +32 (0)2 673 61 00 | **Fax** +32 (0)2 660 10 72 | info@uitp.org | **www.uitp.org**