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Land Transport Authority

► EXECUTIVE SUMMARY

SHARING OF DATA IN PUBLIC TRANSPORT

VALUE, GOVERNANCE AND SUSTAINABILITY

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PARTNERED WITH

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The world is seeing an exponential growth in consumer and industry data, triggered by rapid developments in digitalisation such as an increase in the use of Internet-of-Things (IoT) and data-generating devices including smartphones and connected wearables. There is a growing desire amongst all sectors, including public transport, to understand the value and opportunities that this explosion of data creates.

Data sharing can unlock new insights and lead to more efficient processes and new products. However, there are instances where certain types of data might not be suitable for sharing due to privacy, competition law or commercial restrictions and concerns.

In 2018, UITP discussed how the sharing of data can stimulate innovation.¹ This new study looks deeper into the current state of data sharing² in public transport, and discusses guidelines and recommendations for organisations that wish to understand the benefits of, and best practices in, data sharing. The study's Project Team consulted over 100 organisations from the public transport and other data sectors through an online survey, two workshops, a roundtable discussion and a series of interviews. In addition, a number of blog posts from experts on particular subjects are available on the UITP website.

The study was co-funded by the Land Transport Authority (LTA) and conducted in partnership with Oxera Consulting LLP.

DATA SHARING IN PUBLIC TRANSPORT TODAY

MIXED VIEWS ON DATA SHARING

The public transport organisations consulted for this study expressed mixed views about the current landscape of data sharing. **On one side, it was seen as complex, fragmented and lacking in standardisation.** The basis of these negative views is perhaps rooted in concerns over privacy, reputation and trust.

At the same time, there is much hope and enthusiasm that data sharing can unleash great opportunities and drive positive outcomes when done right.

The Project Team surveyed 55 public transport organisations to establish the key factors that are driving public transport organisations to share data, and what the main barriers are.

The results showed:



Top drivers for data sharing: increasing customer satisfaction, improving urban mobility performance, achieving operational excellence, complying with open data public policy, and developing new business opportunities



Main barriers to data sharing: privacy concerns, liability risks, ambiguity of data ownership and risk of losing competitive advantage

This study therefore sets out to provide practical frameworks and ways of thinking to help organisations understand when and how to share data in a sustainable way.



¹ UITP, 2018. The value of data for public transport, Action Points.

² The study reviewed sharing practices and attitudes towards customer data and mobility data. Customer data refers to all data on the customer, as well as passengers preferences and their use of the system, mobility data is defined as data which provides information on urban mobility patterns.

WHAT WE NEED TO RECOGNISE ABOUT DATA SHARING

THE DEBATE OF SHARING STEMMED FROM UNIQUE PROPERTIES OF DATA

Data has frequently been dubbed ‘the new oil’. However, unlike oil and other physical goods, it can be difficult to understand the value of data due to its unique properties:

- Use of data by one user does not prevent others from using the same data at the same time.
- It is often considered an asset, but its value may or may not depreciate over time (for example, browsing history from a week ago might soon become worthless while the location of an asset might remain constant).
- Its value may increase when supplemented with more data.
- Usage of data does not lead it to disappear.

The mix of these properties means that organisations need to think differently about how to trade or sell data compared to physical goods: the next question is ‘*how can I understand the value of data sharing?*’ This is important because an increased understanding of the value of data sharing helps organisations align their incentives to participate in a data sharing ecosystem and restructure their way of functioning to be more data conscious.

UNLOCK THE VALUE OF DATA THROUGH VALUATION



The value of data depends on the perspective taken – that is, from whose point of view the valuation is conducted. A perspective can be narrow (i.e. can be that of an individual or company), or that of a closed group that exchanges data bilaterally, or that of an entire society that is affected by the data ecosystem. Often, the value of data sharing increases as the perspective widens.³

The study has explored four valuation methods to help organisations understand the value of sharing data:

- Cost-based
- Income-based
- Market-based
- Externalities-based

As all of these methods make various assumptions and adopt different perspectives, organisations are encouraged to use several valuation methods to understand the values of their data sharing from different perspectives. This range of values will enable a clearer estimate of the value of data sharing, allowing organisations to identify where the pockets of value and the bottlenecks are. Doing this will, in turn, enable them to establish which datasets would generate most value (from whichever perspective is taken), thus helping to answer the ‘*what data should I share?*’ question.

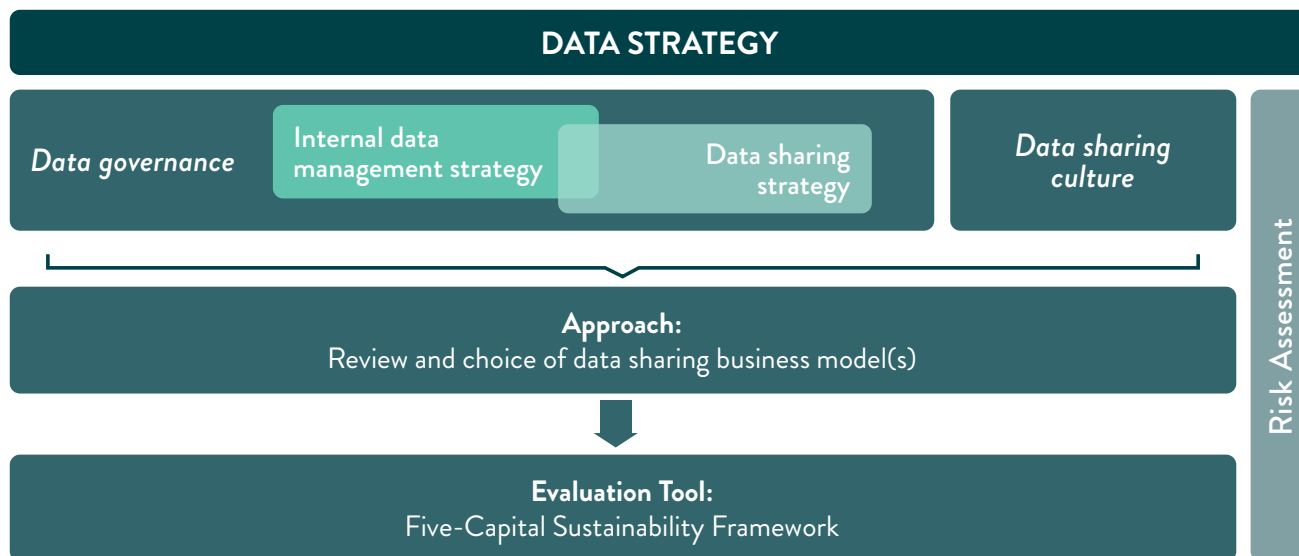
PUT DATA SHARING AT THE CENTRE OF BUSINESS PRACTICE THROUGH A DATA STRATEGY

Of course, data sharing does not exist in isolation; it is one part of a much wider discussion. A holistic view of data sharing needs to be based on a data strategy that covers data governance, the data sharing culture and risk assessments. The data strategy sets the foundations of how an organisation interacts with data and is crucial when choosing data sharing business models and assessing their sustainability. In particular, a data strategy should align with wider corporate purpose and objectives – this ensures that it is always clear why particular data is being shared.



³ The valuation of data sharing also depends on the costs and benefits of the data sharing arrangement.

MAKING BETTER USE OF DATA: DATA SHARING STRATEGY IS PART OF DATA STRATEGY



Source : UITP, Oxera, 2020

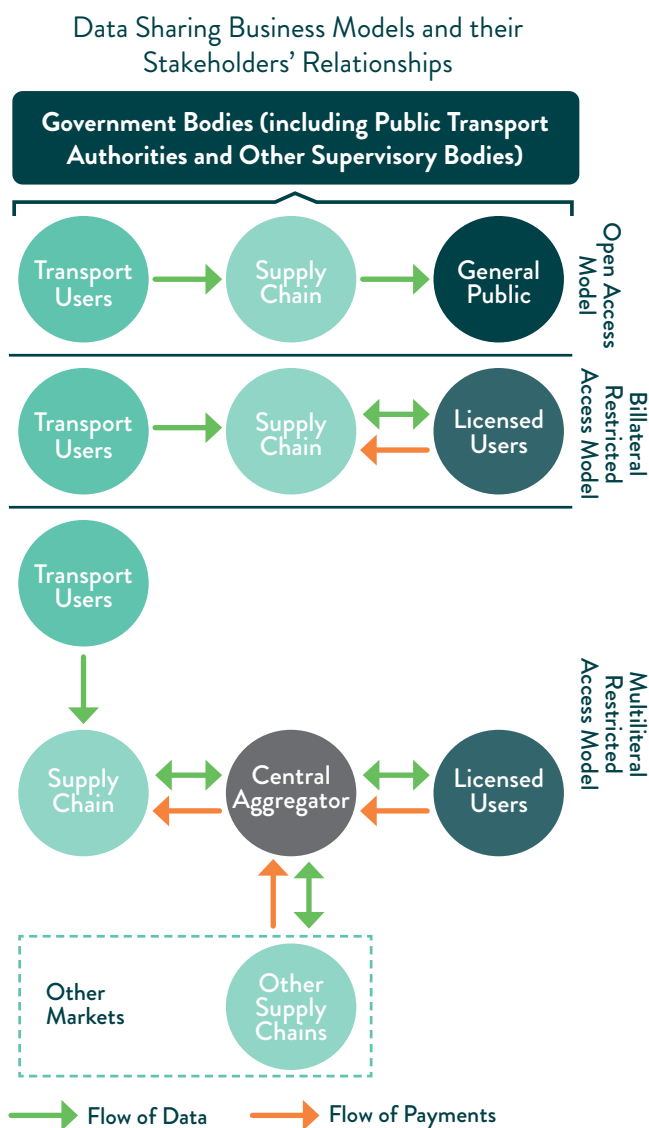


Data sharing is a fluid process, and an organisation should continually review and refine each component.

DATA SHARING BUSINESS MODELS

Having understood the *why* question, the next questions are with *who* the data should be shared, and *how*. The data sharing ecosystem requires **sustainable business models to enable long-term data exchange**. This study has reviewed three frequently used data sharing models – the Open Access, the Bilateral Restricted Access, and the Multilateral Restricted Access.

The three business models can be selected or combined in different ways, depending on the data and the stakeholders involved. The study has highlighted the application of these models across several cities, including London, Taipei and Singapore.



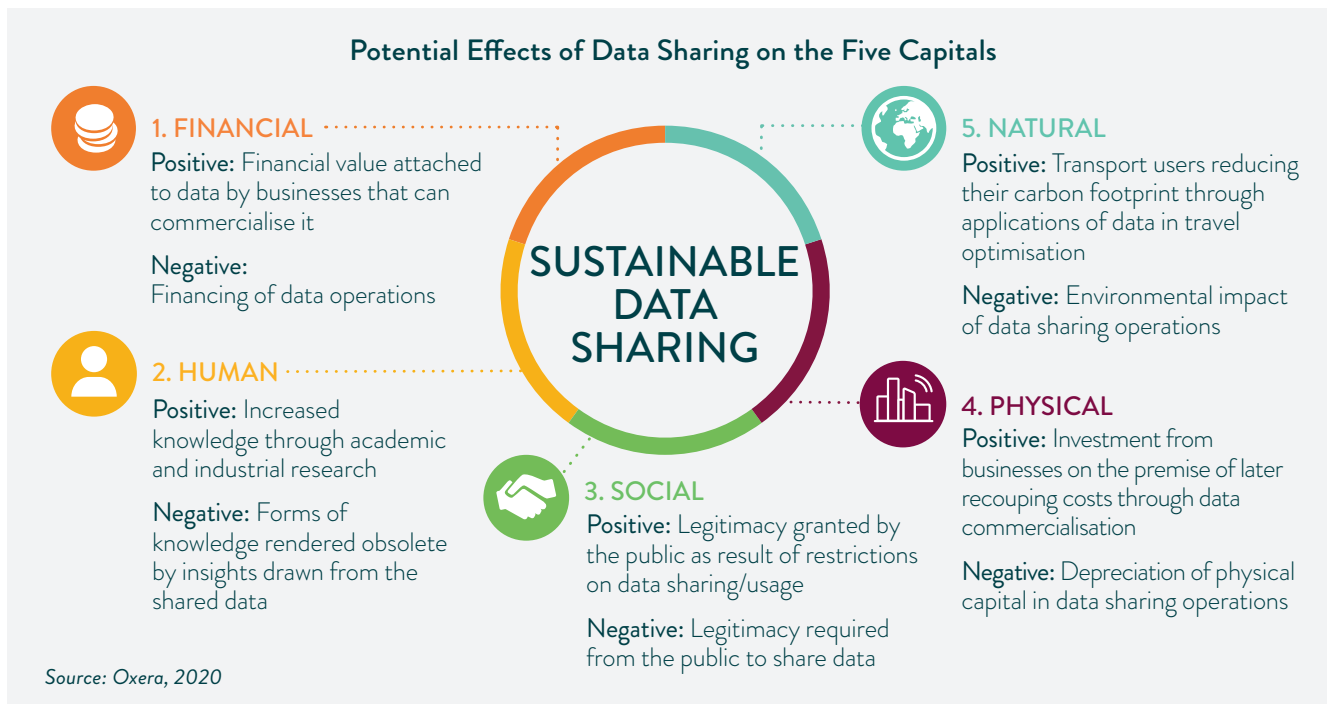
Note: The supply chain represents the system of stakeholders involved in the supply of data (e.g. generators, collectors, data owners, data holders, aggregators and distributors).

Source : Oxera, 2020

FIVE-CAPITAL FRAMEWORK OF SUSTAINABILITY

It is necessary to have an objective way of choosing between these different models: one of these is the Five-Capital Framework, which can be used to assess a given business model's sustainability.

Under this framework, a business model is deemed sustainable if its net impact on each of the Five Capitals can be reasonably expected to be positive when taking into account a wider societal perspective.



FOSTERING A CULTURE OF DATA SHARING

Of course, no business model is merely a piece of paper; it relies on people in an organisation to implement. A data sharing culture drives the attitudes and behaviours around data sharing practices amongst internal and external stakeholders. The study identified the following four key elements of a healthy data culture:

- **A 'data as an opportunity' mindset:** An organisational shift from compliance to a culture of seeing data as an opportunity, without downplaying the importance of risks
- **Executive leadership:** A top-down system of recognition, incentives, funding and reward for data sharing contributions embedded in the organisation's workflow
- **Building of trust:** A solid foundation of transparent goals within and outside the organisation
- **Fostering of data literacy:** Responsibility for IT skills and data management protocols as the responsibility of all staff rather than one or a few departments

OUTLOOK ON DATA SHARING

In addition to exponential growth in data derived from public transport operations, the innovative developments of new

mobility service offerings, such as Mobility as a Service (MaaS), are hinging on a sustainable data sharing ecosystem. Hence, it is expected that the following factors and elements will grow in importance:

- **Data standards** to pave the way for efficient transmission of data from multiple systems (acknowledging that standardisation can reduce innovation)
- **Data stewards⁴** to build a culture across sectors, and to protect the use and privacy of data
- **Transparency and control** to ensure the sustainability of data ecosystems
- A data system that ensures **incentives are aligned and value is created** along the value chain balancing the complexity of data sharing with the benefits it can enable
- **Trust amongst stakeholders** through establishing a data trust⁵ to help address transparency, accountability, data generators' rights, and controls in data governance (acknowledging that data trusts are a novel concept with advantages and drawbacks)
- **Growth in advanced technologies** such as cloud storage, deployment of 5G, IoT, and blockchain

⁴ Data stewards can come from business units, including non-IT, with a primary responsibility for the data content, context, and associated business rules (ISO/IEC, 1994).

⁵ The Open Data Institute defines a data trust as a legal structure that provides independent stewardship of data.

MOVING FORWARD TOGETHER

Data sharing is a complex issue and to be combined with interconnected urban mobility systems, where organisations are required to step up to be data-driven, and data sharing collaborations within public transport or cross-sectorial are expected to gain importance.

The challenge of data sharing is not exclusive to the public transport sector. Establishing a sound data sharing governance framework requires the buy-in of a range of government agencies. Moving forward, the public transport sector needs to work on the following critical actions:

- Engaging national and local leadership in data sharing decisions
- Breaking down silos in government agencies as well as amongst external stakeholders to encourage greater data interoperability
- Advocating the need for data sharing to manage recovery and crisis strategies

The post-COVID-19 world poses many uncertainties, but it is clear that different stakeholders, sectors and countries need to collaborate to provide strong, consistent and sustainable services to citizens. The topic of data sharing is becoming increasingly prevalent, and motivations can go beyond individual financial gains to benefiting the wider community.



This is an official Report of UITP, the International Association of Public Transport. UITP has over 1,800 member companies in 100 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 worldwide.

This Report was prepared by UITP Asia-Pacific Centre for Transport Excellence.



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