



PROJECT NO: 3-023

Frictionless ticketing for Public Transport: Appendix 3: Regulatory review

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Centre for Technology Infusion

About this Appendix

This project is a collaboration between Transport for New South Wales, iMOVE and The Centre for Technology Infusion with the objective to evaluate emerging technologies that can deliver frictionless ticketing for public transport.

To keep the main report readable, we have included full reports of legal and regulatory review in this appendix.

This report has been prepared by:

- Dr Ann Wardrop, Honorary Adjunct Senior Research Fellow, Law School, La Trobe University
- David Wishart, Adjunct Professor, Law School, La Trobe University
- Louis de Koker, Professor, Law School, La Trobe University

Contents

About this Appendix	2
List of acronyms and abbreviations	4
Introduction.....	5
Summary.....	6
The Current Regulatory Environment.....	7
Eight Attention Areas	9
1. Regulatory Context.....	10
2: Enforcement and Compliance	12
3: Privacy and Data Protection	13
4: Discrimination	20
5: Payment Regulation	21
6: Competition Policy and Law	24
7. Platform Regulation	26
8: Interoperability and Standards	27
Selected References	30

List of acronyms and abbreviations

AHRC	Australian Human Rights Commission
AI	Artificial Intelligence
CBDCs	Consumer data rights
CDR	Central bank issued digital currency
CFR	Council of Financial Regulators
EU	European Union
IP	Intellectual property
ITS	Intelligent Transport System
JPC	Joint Parliamentary Committee
Maas	Mobility as a Service
NFC	Near-field communication
PSR	Payment systems review
RBA	Reserve Bank of Australia
SVF	Stored-value facilities
US	United States

Introduction

Legal framework of NSW public transport payment system mapped and legal issues in emerging systems identified: literature survey

As part of the collaboration between Transport for New South Wales (Transport), iMOVE and The Centre for Technology Infusion, La Trobe's International Law Centre undertook an in-depth review of government policies, laws, regulations and other barriers to using frictionless ticketing solutions.

This document presents a review of local and international literature. It identifies the significant legal issues in relation to new and emerging frictionless technology ticketing options in so far as those issues appear in government, academic and media reports and literature.

This paper commences with an overview of the current regulatory environment within which public transport operates in NSW. It is included to ensure all parties to the project are on the same page with regards to the applicable law. It is followed by a high-level discussion of each of the legal issues identified in a review of the literature.

The methodology adopted in the literature review was as follows: the regulatory and legal literature in the field of frictionless public transport travel options was searched using a variety of databases. For media reports, Factiva; for international journals, Google Scholar, HeinOnline LexisNexis and Westlaw; and for Australian journals, Australian Legal Journals Index, AGIS and Proquest. In addition, the La Trobe Library search engine was used. Search algorithms incorporated terms such as 'frictionless ticketing', 'facial recognition', 'public transport', 'MaaS', and 'ticketing' in various combinations.

Summary

In summary, the review finds that the key legal attention areas discussed in the literature concerning Mobility as a Service (MaaS) and frictionless ticketing systems are:

1. Regulatory context
2. Compliance and Enforcement
3. Privacy and Data Protection
4. Discrimination
5. Payments Regulation
6. Competition Policy and Law
7. Platform Regulation
8. Interoperability

None of the issues identified in relation to these topics appear to be fatal to the in-principle adoption of any particular technical solution in NSW, although every solution requires attention to the relevant legal issues to ensure that the detailed design fits within a fit-for-purpose regulatory environment.

NSW legislation and regulations may need some amendment to ensure technological neutrality in its transport regulation for the future. For example, the concept of ‘authority to travel’ is linked to the notion of a ticket as a *physical* item, even allowing for later amendments providing for the use of Opal cards and debit or credit cards. This does not easily fit with an authority to travel conferred by the use of biometrics. It may not be a major issue, as the regulations could be amended, or an exemption obtained. On the other hand, amendment of the 2017 and 2014 Regulations to incorporate biometrics for ticketing may involve significant political considerations and exemption for the ticketing provisions could shift legal liability from the operator to Transport. Depending on the scope of any pilot project, these challenges may need to be navigated. On the issue of tickets, see further under Regulatory Context below.

Three matters are worth noting.

1. All legal issues identified in the survey are highly specific to the jurisdiction about which an article or paper was written.¹ A discussion of any approach adopted elsewhere in the world is only relevant to the extent that it identifies an issue which may or may not obtain in the NSW legal context. Accordingly, in what follows, where a discussion in the literature of a legal issue is in respect of law relevant to NSW, it is considered in detail here. Where the law considered in the discussions is not applicable in NSW, it is reported here at a more abstract level.
2. Details of proposed solutions matter when the law is applied. A slight difference in, say, consent protocols may lead to a very different result in terms of privacy laws. Or, for example, choices in biometric information gathering, storage and processing have significant implications for the applicability of privacy principles.²
3. There is no authoritative source for the law in this field and no one report or article is particularly significant in relation to the project. What follows, then, is a compilation from many sources. Reference is made to anything particularly cogent and any applicable law but not otherwise.

¹ For example, Elizabeth A Mapelli, ‘Inadequate Accessibility: Why Uber Should be a Public Accommodation Under The Americans with Disabilities Act (2018) 67 *American Universities Law Review* 1497, makes a good point about the relevance of discrimination law but beyond that is not particularly useful in the NSW context.

² Wael Elloumi, Cyril Cauchois and Charlotte Pasqual, ‘Will face recognition revolutionise the shopping experience?’ (March, 2021) *Biometric Technology Today* 8, 9.

The Current Regulatory Environment

This section sets out the understanding of the authors of this review, so far as the Transport website and the relevant legislation and regulations appear to set it out, as to the legal structure of ticketing within public transport in NSW. The authors are all too aware of the difference between an apparent formal structure and reality, and accordingly include the section to set out our understanding. If reality departs from a formal legal structure, consequences ensue—this is the principle underpinning the discussion of the regulatory context of new systems.

The primary legislation for ticketing and authorities to travel, including fares and terms of travel, on public transport in NSW is the *Passenger Transport Act 1990* (the Act) as amended in part by the *Passenger Transport Act 2014*. The provisions of the latter, were it brought into force in full, would replace the earlier Act. The *Point to Point (Taxi and Hire Vehicles) Act 2016* applies in relation to transport by a motor vehicle other than a bus.³ There is a considerable amount of both State and Commonwealth legislation in relation to other matters to do with public transport, including accreditation of operators of public passenger services, contracting of passenger services, licensing of air routes, authorisation of drivers, safety, providers, routes and so forth. Regulations have been made under powers set out in the various Acts, not the least being the *Passenger Transport (General) Regulations 2017* under the *Passenger Transport Act 1990*, the *Passenger Transport Regulations 2014* and the *Passenger Transport (Opal and Other Fares) Order 2016* under the *Passenger Transport Act 2014*, and the *Point to Point Transport (Taxis and Hire Vehicles) Regulation 2017* under the *Point to Point (Taxi and Hire Vehicles) Act 2016*. Of course, regulations cannot exceed the powers provided in the Act, a point of some relevance below.

For payments for travel, the conceptual structure set out in the regulations is that to travel on public transport, a passenger must have an authority to travel. This can be obtained through payment to Transport in one of the approved ways: purchase of a ticket by cash or card, use of the Opal account-based card, a smartcard payment, or other as yet unspecified ways. ‘Smartcard’ includes an approved payment device. The passenger enters into a contract with Transport for the provision of authority to travel. The passenger receives the authority to travel (or ticket). This contract is not for the service, merely for the authority to use the service (or ticket).

The transport service provider contracts with Transport to provide the service to customers with authority to travel.

When a passenger with an authority to travel accesses a public transport service, the passenger and the provider of the service enter a deemed contract under which the passenger with authority to travel promises to abide by the conditions of travel for that service, and the provider promises to provide it. Transport is excluded as a party from that contract, regardless of whether Transport took any part in receiving the fare.

There is a degree of ambiguity over the concept of a ‘ticket’. For the purposes of the deemed contract and liability, under the Act and Regulations an authority to travel is a ticket and covered by the notion of ‘ticketing’, regardless of whether it was acquired by the purchase of a ticket, by the use of the Opal card or other means, as spelled out in the Regulations. Hence ‘ticket’ has both a broad and a narrow meaning within the regulatory context of payment for public transport.

Correct payment of fares and compliance with conditions of travel are dealt with under separate regulations. These hinge around the possession of a ticket in a broader sense.

Beyond this point, the relationships between the various parties becomes complex. A fourth contract may exist between Transport and any financial institution or other payments institution if the payment to Transport is other than cash. If the payment has been made with an Opal card, it is with the Government’s banker, Westpac. Were it to exist, this contract would provide that Transport will accept the Opal card for payment

³ Point to Point (Taxi and Hire Vehicles) Act 2016 (NSW) s 4.

and its account will be credited when the payment is accepted. If a credit or smartcard is involved, the credit card issuer would have a similar contract with Transport that on acceptance of the card payment Transport's account at Westpac will be credited. These contracts would contain various terms around credit limits, provision of payment services and so forth. Alternatively, setting up an Opal account or registering a credit card might confer an authority to travel with that authority being withdrawn if payment is not made; for example, if there are insufficient funds in the account.

Under another contract, one subsuming those referred to immediately above, an electronic ticketing payments system is currently provided by Cubic Transport Systems. This system receives payments, dispenses the authority to travel and distributes funds on behalf of Transport.

A sixth contract exists between the passenger or customer and the issuer of the card, whether that is the Opal card or any other credit or smartcard. This is a credit contract (or debit, if it is an account-based card) and includes provisions or a code around unauthorised use.

The fare structure is provided by fares orders issued by Transport under regulation. Concessions and subsidy schemes are provided by the Minister under an order published in the Government Gazette.

A number of Acts of general application apply to public transport, even if indirectly. Of relevance are anti-discrimination, privacy, payments system regulation, and competition and consumer protection Acts.

Legal structures and contexts inevitably throw up legal issues when new technology is introduced. Similar issues have been thrown up by earlier technology and for the most part have been dealt with more or less by suitable regulatory change and formations of contracting. Thus, for example, the Opal card terms of contracting deal with issues in account-based authorisation to travel payments, and regulatory exclusions deal with the suspension of concessions in the context of the *Anti-Discrimination Act*.

Eight Attention Areas

The following are the issues captured in government reports, academic articles, and media reports. The issues are those which may arise on the introduction of new technology in the public transport payments space. Most are unlikely to be of great concern to the project and are low risk either because they are easy to deal with at design stage or are unlikely to give rise to serious detriment due to the small sums at stake. Nevertheless, their impact varies with technology; thus, for example, facial recognition brings privacy concerns to the fore and has proved sensitive in international contexts and in Australia. The Australian Human Rights Commission (AHRC) recently called for a moratorium on the use of biometric technology in ‘decision making’ where there is a ‘high risk to human rights, such as in policing and law enforcement’ (Rec 20). It also called for federal, state and territory governments to introduce legislation to specifically regulate the use of biometric technology (Rec 19). Notwithstanding the AHRC’s recommendations, the assumption is that these issues can be dealt with at a design stage assuming that data flows are correctly mapped. Their differential impact is noted where relevant.

It is also worth noting that the rise of the class action enables many travellers or other persons affected to join together even if the amount involved is only a few cents for each person. As a result, matters previously considered low risk may become of greater concern. A bill to control class actions, the Treasury Laws Amendment (Measures for Consultation) Bill 2021: Litigation Funders, is currently before Commonwealth Parliament with consultation now complete.⁴ It seems likely that the use of class actions and/or litigation funding will be restricted in coming years, somewhat mitigating this concern.

There are few reports and literature surveys that attempt to cover the field and place the issues and topics into some sort of order. MyCorridor Consortium’s analysis of legal and regulatory issues involved in *Mobility as a Service in a Multimodal European Cross-Border Corridor* is particularly helpful.⁵ It identifies relevant high-level issues, but being a report for the European Commission there is an emphasis on interoperability.

In what follows a strong distinction is made between overseas and local material. International material comments on the law in foreign jurisdictions and is therefore not necessarily relevant to NSW. To that extent their utility is limited to identifying issues. Local material, especially when commenting on NSW matters, is more directly relevant and is reported in more detail; for example, the discussion of privacy, data protection, and payments regulation is more extensive.

⁴ <https://www.ag.gov.au/legal-system/consultations/ensuring-fair-and-reasonable-returns-class-action-members> (last accessed 29/11/2021).

⁵ http://www.mycorridor.eu/wp-content/uploads/2021/01/MyCorridor_D7.4_Analysis-of-legal-and-regulatory-barriers-in-MaaS_Final.pdf (accessed 17/11/2021).

1. Regulatory Context

There is no general description of the regulatory context of the NSW public transport system extant in the literature. The description provided above is as best as we can determine the situation to be.

It is a commonplace that any changes in ticketing systems would have to fit within the current regulatory environment or that environment would have to be changed. We particularly note that there is a degree of dissonance creeping into the regulatory environment as it adjusts to new payment modalities. The Act is drafted with the idea of a paper ticket as its core organising concept with adjustments simply grafted on. The 2014 and 2017 regulations are drafted on the assumption there is a conventional paper ticket or an electronic device as the ticket. While an electronic token can more readily be seen to fall within the definition of a 'ticket' under paragraph (c) of clause 69 of the 2017 regulation,⁶ the advent of biometric recognition systems challenges those notions as it is difficult to point to a process by which an authority to travel can be conferred. For example, the *Passenger Transport (General) Regulation 2017* read together with the *Passenger Transport Regulation 2014* confers authority to travel on holders of a conventional 'printed ticket', 'smartcard' or any 'other thing issued...to travel on a public passenger vehicle or train' for which the correct fare has been paid.⁷ An authority to travel arising by facial recognition is not necessarily a 'smartcard' (because there is no 'card' nor is there a 'device' that is scanned at a 'smartcard reader') nor is there a printed ticket nor arguably 'any other thing issued' by an operator or Transport 'for the purpose of authorising a person to travel on a public passenger vehicle or train used to carry on the service concerned'. It has been suggested that perhaps the 'smartcard' concept can be used for biometric recognition systems, in the form of an 'other payment device' (subject to publication in the Gazette). The unique facial pattern is then the 'device' and the 'reader' is the scanner or camera; then the software process linking the person and the travel authorisation is a digital ticket. However, this is a strained interpretation, especially in equating a face to a 'device'.⁸

Further difficulties arise for biometrics under clause 10 of the *Passenger Transport Regulation 2014 (NSW)*. This clause provides that if:

- 1) a passenger uses an Opal card, or
- 2) any other 'ticket' (where the purchase money is payable to Transport directly or indirectly), or uses
- 3) an approved payment device (as narrowly defined)

to access a public passenger service (as defined), then the following results:

- 1) a contract is formed between the operator and the passenger *but not* Transport, and
- 2) Transport is not liable for:
 - a) any thing done or omitted by the operator, or
 - b) for the carriage of the passenger, and
- 3) Transport is not taken to be in a relationship of principal and agent with the operator.

⁶ Cl 69 of the *Passenger Transport (General) Regulation 2017 (NSW)* provides a 'ticket means an authority to travel on a public passenger vehicle or train that may take any of the following forms – (a) a printed ticket, (b) a smartcard, (c) any other thing issued by or on behalf of the operator of a public passenger service or rail passenger service or TfNSW for the purpose of authorising a person to travel on a public passenger vehicle or train used to carry on the service concerned'. See fn 8 below for the narrow definition of 'smartcard'.

⁷ *Passenger Transport Regulation 2014 (NSW)* cl 9 and *Passenger Transport Regulation 2017 (NSW)* cl 69-71.

⁸ Cl 70 of the *Passenger Transport (General) Regulation 2017 (NSW)* defines 'smartcard' as '...(a) a card issued by or on behalf of TfNSW – (i) on which an amount, or an entitlement to travel on public passenger vehicles or trains may be recorded electronically, and (ii) that may be scanned at and read electronically by, a smartcard reader for the purpose of enabling the person by whom the smartcard is held to pay for, or exercise an entitlement to travel, on public passenger vehicles or trains (regardless of whether the smartcard may also be used to pay for, or exercise a right to, travel on other public transport systems, (b) an approved payment device...'. An approved payment device is defined in cl 69 as 'a smartcard that is a credit or debit card, or other payment device, of a class approved by TfNSW, by notice published in the Gazette, for payment of fares by scanning at a smartcard reader'. A 'smartcard reader' is defined in cl 71 and is 'a type of device, that under the authority of TfNSW (a) is installed on a public passenger vehicle or train or at a place at which passengers may board or leave public passenger vehicles or trains (including transport interchange) or is carried by an authorised officer, and (b) is of a make or model specified from time to time by TfNSW by notice published in the Gazette or uses software of a type, or with a capability, specified from time to time by TfNSW by notice published in the Gazette'.

In short, an Opal card, 'ticket' or 'approved payment device' (as narrowly defined under cl 69 of the 2017 regulation) are risk allocation devices and allocate liability to the operator away from Transport in relation to the passenger's carriage.

Clause 77D of the 2017 regulations also provides that a person must not board a bus or enter various areas without processing a valid ticket. The definition of 'processing a ticket' other than a smartcard does not appear to comprehend facial recognition or other biometrics 77(2), unless the strained interpretation discussed above is adopted, the Regulations are amended, an exemption issued, or another document substituting for a ticket is issued.

2: Enforcement and Compliance

While enforcement of and compliance with ticketing requirements are of the essence of public transport, there is little in the literature to disturb the picture of ‘prosecution’ as the core concept for enforcement and compliance. This is despite an extensive literature on regulatory compliance and the general popularity of criminological studies ranging far beyond ‘prosecution’.

Enforcement in many ways is simply a technological issue for each of the proposals: the absence of authority to travel should be able to be determined whether by a device held by an authorised officer, or through geolocation or biometrics.

There are, however, three issues which impinge on the matter from sidewinds, as it were:

- The centrality of the possession of a valid ticket for the operations of the enforcement provisions in Division 4 of Part 6 of the *Passenger Transport (General) Regulation 2017 (NSW)*, notwithstanding the adjustments made by the inclusion of Division 3 as to smartcards might limit enforcement options. This is an example of the point made above in the section of this review on Regulatory Context. As technology gets more distant from the origin of the evidence of fare payment in the issuing of a physical ticket, so the adjustments necessary to fit the new arrangements into the conceptual structure of the empowering Act become more tortured.
- As ticketing moves towards being a non-government matter, the interface between non-payment as a civil wrong and criminal enforcement systems can become problematic, as it has in Victoria.⁹ Non-payment of road tolls in Victoria is in essence a civil matter yet they are pursued as a matter of civil compliance. Generalising this issue, then, as the structure of the transport industry becomes more complex and as disruptor technology moves in as narrated below in the section on competition policy and law, attention will have to be paid to the adjustment of the regulatory framework for enforcement. This adjustment should take account of the proper province of civil, civil penalty and criminal enforcement. The distinction between these can involve complex jurisprudential questions as to the onus and standard of proof, and as to appropriate procedure. Furthermore, there is a question of who bears the cost of ensuring compliance.
- Even apart from the use of artificial intelligence (AI) in identifying people through facial and other biometric recognition technologies, the place of AI in enforcement decision-making has become controversial. The now classic example is the Robodebt scandal, in which decisions to pursue overpayment of Centrelink payments were made, or at least informed by algorithm and were the subject of a successful class action.¹⁰ The operating principle seems to be that even for facial recognition, no decision should be made without human intervention; at least, this is the position of the New South Wales Police.¹¹

None of these issues appear as yet in the literature about transport payment systems.

⁹ Rivers Economic Consulting, *Regulatory Impact Statement. Proposed Infringement Regulations 2016* <https://www.vic.gov.au/sites/default/files/2019-11/Infringement-Regulations-2016-RIS.pdf> (accessed 29/11/2021).

¹⁰ *Prygodicz v Commonwealth*, [2021] FCA 634.

¹¹ *New South Wales Police Force and Facial Recognition* https://www.police.nsw.gov.au/crime/terrorism/terrorism_categories/facial_recognition (accessed 21/12/2021). See also the Victorian Government *Guidelines to surveillance and privacy in the Victorian public sector* May 2017 <https://ovic.vic.gov.au/wp-content/uploads/2018/07/Guidelines-to-surveillance-and-privacy-in-the-Victorian-public-sector.pdf> (accessed 21/12/2021).

3: Privacy and Data Protection

Public transport ticketing generates vast amount of information, even absent MaaS. The gathering, processing, and retention of this information prompt much of the current literature on public transport and several topics have been considered in the literature.

These topics overlap and are only to varying degrees about government policies, laws and regulations. They include facial recognition and the use of biometric data, surveillance, reidentification after deidentification, AI, data security, privacy, information sharing, interoperability and data as property. To put these topics into the Australian legislative framework, facial recognition, biometric data, and AI are about how data is 'collected'; surveillance, reidentification and privacy are about its 'use'; and data security, information sharing and data as property are about its 'retention/storage'. However, the categories overlap in concept and when dealt with in the literature. The MyCorridor Report is useful here to tease the issues and topics apart. They are separately considered below, although this forces some repetition.

Privacy

Much of the information generated through ticketing by whatever means is retained centrally although some is instantly deleted and some is retained on a customer's device (if used). Access to the data is critical for decision-making and planning as well as being necessary for the day-to-day functioning of the system.

On the other hand, privacy is a public policy objective recognised in both Commonwealth and NSW statutes (*Privacy Act 1988 (Cth)* and *Privacy and Personal Information Protection Act 1998 (NSW)* ('PIIP Act') and the *Health Records and Information Privacy Act 2002 (NSW)* ('HRIP Act'). The commonwealth privacy legislation is currently under review by the Attorney-General's Department.¹²

The key principles applicable to the gathering, storage and use of personal information by NSW public sector agencies (PSAs) are set out in the PIIP Act and HRIP Act. The Commonwealth *Privacy Act 1988* or similar legislation may apply to any organisations that form part of a complex transport solution. There is very little legal literature specifically about the NSW PIIP Act aside from case notes relating to the *Waters Case*.¹³ Victoria's similar legislation was at issue in the Myki information dump Report.¹⁴ There is a great deal of legal literature dealing with different aspects of privacy regulation in general, ranging from the theoretical and philosophical (e.g. is privacy a 'value, right or interest?')¹⁵ to the more practical and policy oriented literature (what is personal information?).¹⁶

In the *Waters Case*, Mr Waters claimed that the collection of his personal information when he used his Gold Opal card was in breach of s 8(1)(b) of PIIP Act. The Appeals Panel of the NSW Civil and Administrative Tribunal found that the collection of the Opal Card number and time, date, tap on and tap off locations, route identifiers, transfers and mode of transport was personal information the collection of which was reasonably necessary for ticketing purposes. The Panel rejected the argument that it was not necessary to collect all the information because it was possible to collect ticketing information without it being personal.

As a result of the Myki data dump investigation the Office of the Victorian Information Commissioner issued a compliance note under section 78(1)(b)(i) of the *Privacy and Data Protection Act 2014 (Vic)*. Public Transport Victoria had provided a deidentified dataset of public transport users' activity for a public event in which participants competed to find innovative uses for a dataset. Researchers found that it was possible to reidentify people from the dataset.

¹² Australian Government, *Privacy Act Review Issues Paper* (October, 2021).

¹³ *Waters v Transport for NSW*; [2018] NSWCATAD 40.

¹⁴ Office of the Victorian Information Commissioner, *Disclosure of myki travel information*, State of Victoria, 2019.

¹⁵ Australian Human Rights Commission, *Human Rights and Technology Final Report*, 2021.

¹⁶ *Waters v Transport for NSW*; [2018] NSWCATAD 40

The literature surveyed identifies a number of risks that must be considered in the design of any new technology ticketing system under the various Privacy Acts.¹⁷ As a general point it is important to note that privacy obligations are not linked to technologies that are used, but to the way personal information is managed: collected, used, retained and shared.¹⁸ That can be done in a compliant or non-compliant manner and some technologies are more or less likely to be compliant.¹⁹ Risks identified in the literature include:

- 1. Consent:** does the system provide for informed consent when required under relevant legislation? Informed consent in the ticketing arena is not well covered in the literature. There is a vast body of literature on informed consent, including as to bundled consent, in financial services regulation which we will not rehearse here. However, it is clearly an issue and what it required for the provision of biometric information in each specific jurisdiction and at each particular time should be clarified. Moreover, there are special rules for consent by children or other categories of person. The *Commonwealth Privacy Act Review Issues Paper* has a useful discussion on the current law of consent under Australian Privacy Principles and also of proposals for reform.²⁰
- 2. Purpose of Collection:** the personal information must be collected for a lawful purpose that is directly related to a function or activity of the public sector agency and must be reasonably necessary for that purpose (PIIP Act s 8). This was the issue in the *Waters Case*.²¹
- 3. Direct collection:** Is personal information collected directly from the user, and if not, has the individual authorised collection from someone else (PIIP Act s 9)?
- 4. Notice of collection:** What notice is provided to the individual about collection of personal information? (PIIP Act s 10)
- 5. Nature of data:** Is personal information collected only that is necessary and reasonable, not intrusive, is timely relevant, and accurate (PIIP Act ss 10, 11)? Is that true also of the sharing of data (PIIP Act, s 18)?
- 6. Use of data:** Is the personal information used (including shared) only for its stated purposes (PIIP Act ss 8, 17)?
- 7. Retention of data:** Is personal information retained no longer than is necessary for those purposes? (PIIP Act, s 12)?
- 8. Discriminatory data:** If personal information relates to an individual's racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership, genetic data or biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning a natural person's sex life or sexual orientation special attention should be paid to its collection and use, in particular in relation to its disclosure. (PIIP Act s 19).
- 9. Reidentification:** Is it possible to identify any individual directly or indirectly from retained or shared data, even if deidentified? The possibility of reidentification can represent a trap as in recent years the ability of identity to be established from just a few data points has become apparent. The MyKi data sharing fiasco is an example in point.²²
- 10. Accountability:** Is there a defined responsibility and accountability chain to ensure compliance with these principles? What systems are in place for data governance?
- 11. Rights in relation to data:** Have any specific rights in relation to personal information been provided for? These might include, or may in the future include, the rights of access, rectification, erasure, restriction of processing, data portability, objection, and the right not to be subject to decisions based solely on automated decision making, including profiling and the right to be informed about

¹⁷ Caitlin D. Cottrill, 'MaaS surveillance: Privacy considerations in mobility as a service', 131 (2020) *Transportation Research Part A: Policy and Practice*, 50 considers European MaaS from the privacy perspective. emphasising design of the system and trust as the key element in design.

¹⁸ There are articles about the particular risk that various technologies represent; for example, H. B. Wolfe, 'The Mobile Phone as Surveillance Device: Progress, Perils, and Protective Measures,' (2017) 50(11) *Computer*, 50.

¹⁹ See, for example, Office of the Australian Information Commissioner, Australian Government, *Commissioner Initiated Investigation into the Australian Federal Police (Privacy)* [2021] AICmr 74 (26 November 2021)

²⁰ Government of Australia, *Privacy Act Review: Issues Paper* (Oct 2021), 41-49.

²¹ *Waters v Transport for NSW*; [2018] NSWCATAD 40. Office of the Australian Information Commissioner, Australian Government, *Australian Privacy Principles Guidelines* <https://www.oaic.gov.au/privacy/australian-privacy-principles-guidelines>, para 8.45 (accessed 17/12/2021).

²² Office of the Victorian Information Commissioner, *Disclosure of myki travel information*, State of Victoria, 2019.

automated decision-making processes. Such rights are provided in the EU General Data Protection Regulation.²³

- 12. Contiguous use of technology:** Is the technology being used in decision-making that has a legal or similarly significant effect for individuals or where there is a high risk to human rights? These are circumstances upon which the Human Rights Commission called for a moratorium on the use of biometric technology until there was specific regulation about its use. Thus the use of surveillance based ticketing systems to detect fare evasion may be problematic. So also, where decision-making for enforcement is facilitated by AI technologies. The obvious example of problems with the latter is Robodebt, settled by the payment of \$112 million to eligible class action members in June 2021.²⁴

Various ticketing solutions are more or less compliant with these principles. Particular areas of vulnerability, exaggerated by the collection, storage, sharing and use of biometric data appear to lie in the above principles 1, 6, 8 and 9. To put it baldly, the literature makes it clear that mass surveillance, especially combined with automated decision-making, is a problem.²⁵ To the extent that any proposed solution involves mass surveillance, extreme caution to ensure compliance with privacy legislation is warranted. In addition, public opinion has to be navigated.

²³ REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (see <https://gdpr-info.eu/> accessed 1 February 2022).

²⁴ *Prygodicz v Commonwealth*, [2021] FCA 634.

²⁵ Lu, Eva and Stephen McKenzie, 'Privacy law: Big brother is watching: The hidden cost of the Gold Opal card' *LSJ: Law Society of NSW Journal* (45) Jun 2018: p.74-75; Australian Human Rights Commission, *Human Rights and Technology Final Report*, 2021; Office of the Victorian Information Commissioner, *Biometrics and Privacy: Issues and Challenges*, State of Victoria, 2019; European Parliament resolution of 6 October 2021 on artificial intelligence in criminal law and its use by the police and judicial authorities in criminal matters (2020/2016(INI)); Burt, Chris. 'AnyVision proposes three ethical facial recognition principles for police'. <https://www.biometricupdate.com/202109/anyvision-proposes-three-ethical-facial-recognition-principles-for-police> (accessed 29/9/21); Information Commissioner's Office, *Information Commissioner's Opinion: The use of live facial recognition technology in public places* 18 June 2021; Macaulay, Thomas. 'Automated facial recognition breaches GDPR, says EU digital chief'. <https://thenextweb.com/news/automated-facial-recognition-breaches-gdpr-says-eu-digital-chief> (accessed 29/9/21); Van Noorden, Richard, 'The Ethical Questions that Haunt Facial Recognition Research', (2020) 587 *Nature* 354.

Facial recognition and identification through other biometric data

Facial recognition is an obvious way to render travel frictionless. Use of other biometric data such as fingerprint or iris scanning is less effective for this purpose but still considered possibly useful. Any number of articles set out the advantages of facial recognition, although there are also a number of articles doubting that efficacy.²⁶ There are several YouTube videos graphically demonstrating ostensible techniques of avoidance.

A large proportion of the legal literature on the use of biometric data including facial recognition critiques its use on the basis that it is a form of surveillance. The argument is that law enforcement bodies could use AI to identify and track individuals wholly or partly using the data from public transport.²⁷ The most profound consideration of the matter, albeit from a European perspective, was undertaken by the SPIRIT consortium and resulted in a resolution of the European Parliament setting out limits on its use in criminal matters.²⁸

In Australia, the use of facial recognition as a surveillance tool has prompted reports by the Australian Human Rights Commission²⁹ and the National Transport Commission.³⁰

A useful distinction is made in the AHRC Report between ‘many to one’ and ‘one to one’ surveillance. The former is where many people are caught on camera (mass surveillance) and are identified through the use of AI from previously existing biometric databases, such as those that could be generated by public transport. Most of the discussions are about many to one surveillance, including perhaps the only Australian article in a reputable law journal on facial recognition.³¹ Any suggestion of the use of mass surveillance correctly brings substantial societal debate.

Far less antagonism is generated by the adoption of one-to-one surveillance. This is the subject of much media attention as contactless shopping and other uses of biometric identification become more common.³²

Normally but not necessarily in this form of surveillance, the biometric data is provided by the customer and is used only to identify that person. The data may either be centrally held or held on the customer’s own device and provided automatically on demand. Acceptability of such technologies is generally a matter of consent. On the other hand, consent may not necessarily be informed and meaningful, such as that given when downloading an app onto a device. Indeed, various platforms access biometric and travel data on devices as a matter of routine.

²⁶ See Wael Elloumi, Cyril Cauchois and Charlotte Pasqual, ‘Will face recognition revolutionise the shopping experience?’ (March, 2021) *Biometric Technology Today* 8; Mann, Monique and Smith, Marcus. ‘Automated Facial Recognition Technology: Recent Developments and Approaches to Oversight’, (2017) 40 *UNSW Law Journal* 121; Caitlin D. Cottrill, ‘MaaS surveillance: Privacy considerations in mobility as a service’, 131 (2020) *Transportation Research Part A: Policy and Practice*, 50; Elias Wright, ‘The Future of Facial Recognition Is Not Fully Known: Developing Privacy and Security Regulatory Mechanisms for Facial Recognition in the Retail Sector’ (2019) 29(2) *Fordham Intellectual Property, Media & Entertainment Law Journal* 611.

²⁷ Elias Wright, *ibid*; Caitlin D. Cottrill, *ibid*; Asokan, Akshaya. *Facial Recognition Use Triggers GDPR Fine*.

<https://www.bankinfosecurity.com/facial-recognition-use-triggers-gdpr-fine-a-12991> (accessed 29/9/21); Burt, Chris. ‘AnyVision proposes three ethical facial recognition principles for police’. <https://www.biometricupdate.com/202109/anyvision-proposes-three-ethical-facial-recognition-principles-for-police> (accessed 29/9/21); Macaulay, Thomas. ‘Automated facial recognition breaches GDPR, says EU digital chief’. <https://thenextweb.com/news/automated-facial-recognition-breaches-gdpr-says-eu-digital-chief> (accessed 29/9/21); Mann, Monique and Smith, Marcus. *ibid*; Van Noorden, Richard, ‘The Ethical Questions that Haunt Facial Recognition Research’, (2020) 587 *Nature* 354; Tambiama Madiaga and Hendrik Mildebrath, *Regulating Facial Recognition in the EU* European Parliament, 2021, [https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/698021/EPRS_IDA\(2021\)698021_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/698021/EPRS_IDA(2021)698021_EN.pdf) (last accessed 29/11/2021).

²⁸ European Parliament resolution of 6 October 2021 on artificial intelligence in criminal law and its use by the police and judicial authorities in criminal matters (2020/2016(INI)) See also, Tambiama Madiaga and Hendrik Mildebrath, *ibid*.

²⁹ Australian Human Rights Commission, *Human Rights and Technology Final Report*, 2021

³⁰ *National Transport Plan 2020-2023*, Commonwealth of Australia, 2016; David Vaile, Monika Zalnieriute and Lyria Bennett Moses, *The privacy and data protection regulatory framework for C-ITS and AV systems Report for the National Transport Commission*.

³¹ Mann, Monique and Smith, Marcus ‘Automated Facial Recognition Technology: Recent Developments and Approaches to Oversight’, (2017) 40 *UNSW Law Journal* 121.

³² Wael Elloumi, Cyril Cauchois and Charlotte Pasqual, ‘Will face recognition revolutionise the shopping experience?’ (March, 2021) *Biometric Technology Today* 8; Mann, Monique and Smith, Marcus. ‘Automated Facial Recognition Technology: Recent Developments and Approaches to Oversight’, (2017) 40 *UNSW Law Journal* 121. Elias Wright, ‘The Future of Facial Recognition Is Not Fully Known: Developing Privacy and Security Regulatory Mechanisms for Facial Recognition in the Retail Sector’ (2019) 29(2) *Fordham Intellectual Property, Media & Entertainment Law Journal* 611.

Information Sharing

Data is shared by Transport with a number of other bodies and businesses. For example, the Cubic system of necessity requires access to data to carry out its function of operating the ticketing system, albeit as an agent of Transport. Information is shared amongst government agencies; indeed an Australian intergovernmental agreement sets out information-sharing arrangements between various government agencies amongst the Commonwealth, States and Territories, *inter alia* subjecting them to privacy laws.³³

Wherever information is shared under these arrangements, privacy protocols apply, with special attention to reidentification possibilities.³⁴ Division 3 of the PPIP Act provides a number of exemptions from these principles. Sharing information, although not personally identifiable information, between government agencies is governed by the *Data Sharing (Government Sector) Act 2015 (NSW)* which sets out various safeguards. Rights of public access to government information is regulated by the *Government Information (Public Access) Act 2009 (NSW)*. A variety of other legislative provisions govern the sharing of information, including the *Public Transport Act 1990 (NSW)* (s 53) and the *Point to Point Transport (Taxis and Hire Vehicles) Act 2016 (NSW)* s 149.

It is possible that, for the purposes of conferral of an authority to travel, data is gathered from public sources; for example, some biometric recognition systems gather the biometric data from social media and other open internet sources ('scraping'). Information about an individual that is contained in a publicly available publication is not regarded as 'personal information' under s 4(3)(b) of the PPIP Act. In addition, depending on the wording of the relevant Privacy Act, facial images scraped from the web may not be 'personal information' because individuals' identities may remain unknown.³⁵ On the other hand, reidentification could be possible and accordingly the data could fall into the category of personally identifiable information. Accordingly, there are difficult issues of determining the exact point at which privacy requirements apply. Clearview AI was found to breach Australian privacy principles under the wording of the Commonwealth *Privacy Act 1988* for scraping images of Australians from the web for use in its facial recognition tool.³⁶

While there is little discussion of it as yet, although it has been postulated, use of mobile telecommunication location data will complicate the consideration of these matters.³⁷ Due to issues of consent to the use of data, the indirect collection of the data and lack of notice, the fear of universal surveillance, and profiling and discrimination issues associated with the necessary AI, drawing biometric data other than from the user, even if permitted, would seem to be politically risky. The EU Parliament has voted to ban remote biometric surveillance (discussed further below).³⁸

Liability in respect of breaches of requirements can be complex where there are complex contractual arrangements between stakeholders.³⁹ This is compounded in MaaS systems. Data has to be available without control being lost but the information flows are complex. Contractual provisions would be necessary to determine who should be responsible and ultimately liable for any incidents, errors, and breaches without creating barriers to access to data.

Data sharing is also to be considered within the context of the Commonwealth Government's strategic goals for an economy-wide roll out of a consumer data right (CDR) to various sectors of the economy.⁴⁰ CDR 'gives

³³ Council of Australian Governments, Intergovernmental Agreement on data sharing between Commonwealth and State and Territory Governments.

³⁴ Victor Chang, 'An Ethical Framework for Big Data and Smart Cities' Technological Forecasting and Social Change Volume 165, April 2021, 120559, Data Analytics Centre, Data Sharing Frameworks Technical White Paper (2017).

³⁵ Commissioner initiated investigation into Clearview AI, Inc. (Privacy) [2021] AICmr 54 (14 October 2021).

³⁶ Commissioner initiated investigation into Clearview AI, Inc. (Privacy) [2021] AICmr 54 (14 October 2021).

³⁷ Sivia Elaluf-Calderwood, Jonathan Liebenau and Patrik, Privacy Identity and Security Concerns: Enterprise Strategic Decision Making and Business Model Development for Mobile Payments in NFC https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2014205.

³⁸ Natasha Lomas, 'European Parliament backs ban on remote biometric surveillance' Techcrunch 6 October 2021 (accessed 1 February 2022) and see fn 48 below for citation of the Resolution.

³⁹ Jathan Sadowski, Salomé Viljoen & Meredith Whittaker, 'Everyone should decide how their digital data are used — not just tech companies' *Nature*, 1 July 2021.

⁴⁰ Australian Government, Implementation of an economy-wide Consumer Data Right: A Strategic Assessment (Consultation Paper, 2021).

consumers a right to have data held about them to be shared with trusted third parties'.⁴¹ It has already been introduced into banking and energy, and the process has begun for its introduction to telecommunications. Open finance is considered the next priority area for its application.⁴² Treasury has suggested that transport and digital platforms are potential sectors for its application but there is no indication from Treasury of their priority, although Treasury's 2022 *Outcomes Report* sets out 'guiding principles' to assess prioritisation of sectors.⁴³ If frameworks for CDR within transport and platforms are developed this should provide a better regulatory environment for MaaS systems.

Law Enforcement

A major concern expressed in the literature is the collection and use of information for law enforcement and defence requirements.⁴⁴ There is currently a carve-out from privacy protection for the communication of this information⁴⁵ and the extent of the carve-out is well defined in the Transport documents. In an effort to create a more nuanced balance of policies, privacy principles distinguish between non-personal, personal and sensitive data yet the more and more personal the information collected is, the more public unease with its collection will grow regardless of ostensible protections. This poses a risk to the acceptability of any proposed system that changes and enhances data-collection processes. A considerable portion of the literature on facial recognition is about this balance, with some jurisdictions banning police use of mass facial recognition.⁴⁶ The EU Parliament has passed a resolution setting out the limits of acceptable use of remote biometric surveillance.⁴⁷ It includes a call for a complete prohibition on the use of automated recognition in public places of human features (other than facial recognition) such as 'gait, fingerprints, DNA, voice, and other biometric and behavioural signals' and calls for a moratorium on facial recognition systems by law enforcement unless the systems:⁴⁸

have the function of identification, unless strictly used for the purpose of identification of victims of crime, until the technical standards can be considered fully fundamental rights compliant, results derived are non-biased and non-discriminatory, the legal framework provides strict safeguards against misuse and strict democratic control and oversight, and there is empirical evidence of the necessity and proportionality for the deployment of such technologies; notes that where the above criteria are not fulfilled, the systems should not be used or deployed; ...

This remains an important matter to consider regarding public transport data. Some of this data will be used for transport law enforcement purposes, for example in relation to fare evaders, but the data remains a treasure trove for general law enforcement and intelligence purposes too.

Information as an Asset

Information is, in itself, a valuable asset, used for many purposes within government. Arrangements with service providers, such as CUBIC, need to deal with the issue of data ownership, including both the data on travel and intellectual property in information processing algorithms. This is a commonplace and well recognised in the literature and in such contracts as we have seen.

⁴¹ Ibid, 6.

⁴² Australian Government (Treasury), Consumer Data Right, Strategic Assessment: Outcomes (Jan 2022).

⁴³ Australian Government, *ibid*, 14.

⁴⁴ Coughlan, Maggie and Anthony Morgan, 'Trends and Issues in Crime and Criminal Justice' Trends and Issues in Crime and Criminal Justice [electronic resource] (561) Oct 2018: p.1-18; Mann, Monique and Smith, Marcus. 'Automated Facial Recognition Technology: Recent Developments and Approaches to Oversight', (2017) 40 UNSW Law Journal 121; Van Noorden, Richard, 'The Ethical Questions that Haunt Facial Recognition Research', (2020) 587 Nature 354; Lu, Eva and Stephen McKenzie, 'Privacy law: Big brother is watching: The hidden cost of the Gold Opal card' LSJ: Law Society of NSW Journal (45) Jun 2018: p.74-75.

⁴⁵ Privacy and Personal Information Protection Act 1998 (NSW) ss 22-7.

⁴⁶ 13 Cities Where Police Are Banned From Using Facial Recognition Tech (18 November, 2020) <<https://innotechtoday.com>> accessed October 2021. The 13 cities referred to are in the US: Boston, Portland, Maine, Springfield; from Calif: San Francisco, Alameda, Berkeley, and Oakland; from Mass. Brookline, Cambridge, Northampton, and Somerville; Jackson. Miss.

⁴⁷ European Parliament resolution of 6 October 2021 on artificial intelligence in criminal law and its use by the police and judicial authorities in criminal matters (2020/2016(INI)).

⁴⁸ Ibid, [26]-[27].

Assertion of intellectual property (IP) in algorithms by third party vendors can lead to conflict between an agency's obligation to share information with the public under the *Government Information (Public Access) Act 2009 (NSW)*, to audit the use of an algorithm,⁴⁹ and third-party property rights. These issues are currently being litigated concerning a dispute over a third party's assertion of IP in an algorithm used in social housing.⁵⁰

Furthermore, data is an asset the sale of which can generate income.⁵¹ Given that various businesses other than the public transport authority have access to the data, determining ownership of the data and the workings of licenses to use it are issues that need attention in the privacy and data protection context. While accounting standards do not as yet allow data to be an asset in itself, it is extremely valuable both as a segment of big data and for criminal purposes. Thus the literature emphasises that retention of data must be secure and siloed if possible. Where it is shared, property interests in the data must be set out in detail.

⁴⁹ S 121 *Government (Public Access) Information Act 2009 (NSW)* requires an agency to ensure that private sector contractors will provide immediate right of access to specified information relating to the performance of services by the third party. There are exemptions, questions arise as to whether 'algorithms' designed by a third-party vendor may be a 'service' within s 121.

⁵⁰ Samantha Gavel, NSW Information Commissioner, 'AI and Automated Decision-Making: Information and Privacy Commission NSW Perspective' Money, Power and AI: From Automated Banks to Automated States, UNSW 29 November – Tuesday 30 November 2021.

⁵¹ See Murat Sonmez, 'Shaping a Data Economy' Winter 2020 *Finance and Development* <https://www.imf.org/external/pubs/ft/fandd/2020/12/shaping-a-data-economy-wef-sonmez.htm> (accessed 17/11/2021)

4: Discrimination

The physical circumstances of public transport are subject to Anti-Discrimination Law.⁵² So also are ticketing systems and data collection, storage and use. The literature highlights a number of discriminations about digital technology—see the recent 2021 Australian Human Rights Commission Report into Human Rights and Technology.⁵³ There is also a broad literature on the role of transport in social exclusion of people with disabilities.⁵⁴

Of particular note in the context of this review, are discussions of discrimination in facial recognition technology against particular races, genders or people with disabilities. Bias in facial recognition against people with disabilities is less discussed in the literature.⁵⁵ There has been litigation internationally about this issue; for example, a lawsuit in Buenos Aires claiming that Uber’s facial recognition system did not identify drivers of colour, leading to their unfair dismissal.⁵⁶ In general there is considerable discussion in the literature about the danger of biases in algorithms that may discriminate against various groups.⁵⁷ To the contrary are industry commentators who dispute the extent of algorithmic bias in facial recognition technology because of improvements in the algorithms since earlier research was conducted.⁵⁸

The danger of bias has led to literature discussing the role of government in detecting and mitigating algorithmic bias in AI-informed decision making. See, for example, Standards Australia’s 2020 Report which recommends the federal and state governments undertake ‘inclusion by design’ to tackle discrimination in AI through the development of data quality standards.⁵⁹ Other tools for ‘inclusion by design’ (or governance mechanisms) include ‘deliberate over-sampling of Indigenous and minority populations...[and] social disparity audit techniques’.⁶⁰

In summary, the main emphasis in the current literature about discrimination that is relevant to frictionless ticketing or MaaS, relates to algorithmic bias concerns, whether it exists and, if it does, how it might be mitigated.

⁵² For example, Elizabeth A Mapelli, ‘Inadequate Accessibility: Why Uber Should be a Public Accommodation Under The Americans with Disabilities Act (2018) 67 *American Universities Law Review* 1497.

⁵³ Australian Human Rights Commission, *Human Rights and Technology Final Report*, 2021.

⁵⁴ For a 2018 survey of the literature in Scandinavia and selected Western countries see Kristin Ystmark Bjerkan and Liv Rakel Øvstedal ‘Functional requirements for inclusive transport’ (2020) 47 *Transportation* 1177-1198.

⁵⁵ Sherri Byrne-Harber, *Disability and AI Bias* July 11 2019, <https://sheribyrynehaber.medium.com/disability-and-ai-bias-cced271bd533> but see Lachlan Urghart and Diana Miranda ‘Policing faces: the present and future of intelligent facial surveillance’ (2021) *Information & Communications Technology Law* (online) (discussing, among other things, that the UK College of Policing was concerned that disability and age might affect ‘the accuracy and effectiveness of LFR (live facial recognition systems)’): 16.

⁵⁶ Tom Jowitt, ‘Uber sued in Europe over Alleged Facial Recognition Bias’ *Silicon.co.uk* (21 October 2021).

⁵⁷ For example, National Institute of Standards and Technology, *Face Recognition Vendor Test (FRVT) Part 3: Demographic Effects* NISTIR 820 (2019). United States Government Accountability Office, *Face Recognition Technology: FBI Should Better Ensure Privacy and Accuracy*, GAO-16-267 (May 16, 2016); United States Government Accountability Office, *Report to Congressional Requester Facial Recognition Technology Federal Agencies Should Better Assess Privacy and Other Risks* GAO 21-15 (June 2021) and see the references cited to support this point in the Australian Human Rights Commission report, above n 5, at fn 636, namely: ‘Joy Buolamwini and Timinit Guru, ‘Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification’ (2018) 81 *Proceedings of Machine Learning Research* 1; KS Krishnapriya, Kushal Vangara, Michael C King, Vitor Albiero and Kevin Bowyer, ‘Characterizing the Variability in Face Recognition Accuracy Relative to Race’ (Conference Paper, IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, 2019); Inioluwa Deborah Raji and Joy Buolamwini, ‘Actionable Auditing: Investigating the Impact of Publicly Naming Biased Performance Results of Commercial AI Products’ (Conference on Artificial Intelligence, Ethics, and Society, 2019’.

⁵⁸ Jake Parker and David Ray ‘What Science Really Says About Facial Recognition Accuracy and Bias Concerns’ *Security Industry Association*, 23 July 2021 <securityindustry.org> who cite a draft research report from the

National Institute of Standards and Technology containing data from June 28, 2021 they state shows ‘each of the top 150 algorithms are over 99% accurate across Black male, white male, Black female and white female demographics’.

⁵⁹ Standards Australia, *An Artificial Intelligence Standards Roadmap: Making Australia’s Voices Heard Final Report* (2020), 32.

⁶⁰ *Ibid.* Social disparity audit techniques can assist in helping to ‘identify, visualise, and communicate whichever normative values are embedded in a system’ see Jakob Mokander and Luciano Floridi ‘Ethics-Based Auditing to Develop Trustworthy AI’ (2021) 31 *Minds and Machines*, <https://link.springer.com/content/pdf/10.1007/s11023-021-09557-8.pdf>>

5: Payment Regulation

Payment services are an inescapable aspect of public transport and as payment systems become more varied and complex, regulation of the payments system becomes more relevant. Transport is currently excluded from the operation of such regulation.⁶¹ However, the complexity of frictionless payment systems and the increasing number of parties⁶² required to operate them can trigger the regulation of participants in the system. In addition, there are moves for significant changes to the architecture of payments regulation in Australia; those who were not regulated may become regulated, and those who are regulated may be subject to lesser regulation. Whether this is an issue for any participant in any frictionless ticketing or MaaS proposal will depend on the solution adopted. Given that Transport is a NSW Government Agency, it appears not to be an issue for Transport itself.⁶³ However, other participants in payments within frictionless ticketing may be subject to payments regulation, require an Australian Financial Services licence or may have to comply with the ePayments Code now or in the future. For example, if the ticketing solution involves a smartcard and it is widely used as a mechanism for payment of goods or services (including transport), is redeemable in Australian currency on demand by the user, the Australian Prudential Regulation Authority may determine that the provider of the smartcard is conducting ‘banking business’.⁶⁴

Aside from legal textbooks and professional publications,⁶⁵ Australian legal academic literature relevant to electronic and/or frictionless payments has generally focussed on high level regulatory problems rather than detailed analysis of technical rules. Literature on regulatory issues includes discussion of consumer liability for unauthorised transactions,⁶⁶ whether a particular person or platform amounts to a payment system and is regulated by Commonwealth legislation of various stripes;⁶⁷ excessive surcharging by retailers,⁶⁸ regulatory styles of payments regulators,⁶⁹ regulation of fees payable between payment scheme participants (interchange fees),⁷⁰ regulation of smart cards,⁷¹ cryptocurrency,⁷² and payments using blockchain.

Payment using some form of digital currency (stable coins or central bank issued digital currency (CBDCs)) is increasingly discussed in the literature. There is increased interest around the world in CBDCs with numerous studies and actual implementation of CBDCs by some central banks (Bahamas and Cambodia). The Reserve

⁶¹ TfNSW is a government agency not carrying on a business for the purposes of the *Corporations Act 2001* (Cth). Further the *Payment Systems (Regulation) Act 1998* (Cth) and the *Banking Act 1959* (Cth) do not specifically extend the operation of their provisions to States in right of the Crown (unlike the *Competition and Consumer Act 2010* (Cth)). In addition, exemptions exist for transport cards eg where there is one payee under s763D(2)(a)(i) *Corporations Act 2001* (Cth) or for holders of stored value guaranteed by state or local authorities under s 25 of the *Payment Systems (Regulation) Act 1998* (Cth). See Exemption Notice Under Section 25 issued by RBA dated 4 March 2004).

⁶² For example, mobile payments at point of sale today may include ‘the customer, merchant, acquirer [usually merchant’s bank], issuer, and card scheme...payment platform provider, a fraud mitigation engine, and a tokenisation service [among others]: Parliamentary Joint Committee on Corporations and Financial Services, *Mobile Payment and Digital Wallet Financial Services*, (Report, October 2021) 8.

⁶³ *Transport Administration Act 1988* (NSW) s 3C.

⁶⁴ *Banking Regulation 2016* (Cth) reg 6. We do not discuss here the position of TfNSW as a government authority and the question of the application of commonwealth legislation to it as other providers in the payment process may attract such regulation. We also note section 51(xiii) of the Australian Constitution does not extend the power of the commonwealth government to regulate State banks operating solely within the relevant state.

⁶⁵ Alan Tyree & Andrea Beatty, *The Law of Payments Systems* (2000, Butterworths); Alan Tyree *Banking Law in Australia* 10th ed (LexisNexis, 2021).

⁶⁶ Kariyawasa, Kanchana & Tsai, M ‘Digital Wallets and Consumer Protection’ 25(3) 2017 *Journal of Australian Competition and Consumer Law* 183, Hørby Jensen, Camilla and Ann Wardrop ‘Consumer Liability for Unauthorised Electronic Funds Transfers: Perspectives on Regulation from Australia and Denmark’ in N Dietz Legind, et al (eds) *Festschrift til Nis Clausen* (2013, Copenhagen, Dorf Forlag) 213-244.

⁶⁷ Wardrop, Ann ‘Credit Card Regulation, Interchange Fees and the Meaning of “Payment System” in Australia’ (2004) 19(1) *Journal of International Banking Law and Regulation* 68-80.

⁶⁸ Wardrop, Ann ‘Surcharging for payment: Payment systems regulation and the constitution of a new economic norm’ (2015) 26(4) *Journal of Banking Finance Law and Practice* 290-302.

⁶⁹ Wardrop, Ann ‘Co-regulation, responsive regulation and the reform of Australia’s retail electronic payment systems’ (2014) 30(1) *Law in Context* 197-227.

⁷⁰ Ibid; Gans, Joshua and King, Stephen ‘The role of interchange fees in credit card association: a competitive a competitive analysis and regulatory issues’ (2001) 29(2) *Australian Business Law Review* 94-123.

⁷¹ Burbridge, Sophie *Regulating Stored Value Facilities in Australia: Review and Proposals for Reform* (2018) PhD dissertation, University of New South Wales.

⁷² Parsons, Louise ‘Bitcoin Consumer and Regulatory Challenges’ (2016) 27(3) *Journal of Banking and Finance Law and Practice* 184-202, Dirk A Zetzsche, et al ‘Regulating Libra’ (2021) 41(1) *Oxford Journal of Legal Studies*, 80–113; Annabelle Simpson ‘Australian regulation of blockchain and distributed ledger technology in banking and finance’ (2018) 29(2) *Journal of Banking and Finance Law and Practice* 305-376.

Bank of Australia (RBA) has undertaken a proof of concept for the use of CBDCs in syndicated lending.⁷³ On a *per capita* basis Australians have been some of the highest adopters of cryptocurrencies in the world, and so the use of digital currencies for payment in the foreseeable future is no longer discounted in the literature in the way it may have been in the past.⁷⁴

International electronic payments and digital regulation literature deals with similar topics to the Australian literature within the context of the relevant jurisdiction's national or supranational jurisprudence or regulation.⁷⁵

There have been numerous Australian government reports and consultation papers authored by various bodies over the past eight years relevant to payments regulation.⁷⁶ All these reports have proposed various reforms in one way or another that touch upon the regulatory environment for frictionless and new technology payments. Some of the reports raise relevant competition issues and are discussed in the section following this one. Of particular relevance is the 2021 Joint Parliamentary Committee report on mobile payment and digital wallet services (JPC). It approved the Council of Financial Regulators (CFR) 2019 recommendations concerning the regulation of stored-value facilities (SVFs). Also of importance is the Payment systems review of June 2021 (PSR).⁷⁷ Consequently the landscape of payments regulation may change in the future but is not of immediate relevance to this project. Recommendations⁷⁸ of the various reports relevant to participants in a frictionless ticketing in the future include:

- SVFs to be a new class of product replacing 'purchased payment facilities', and should attract 'graduated' regulation based on risk to consumers (CFS Rec 1) (PSR Rec 9)
- Small or limited purpose SVFs should remain 'largely exempt' from regulation (CFS Rec 2) (PSR Rec 9)
- Issuers that hold funds for a short time to facilitate payment be required to hold an Australian Financial Services license and comply with the ePayments Code (CFS Rec 3) (PSR Rec10)
- Large SVFs (eg > \$50 million in client funds) where consumers hold funds (eg > than \$1000) for long periods (eg > than 31 days) and allow payment on demand in Australian currency, should be regulated at the highest level of oversight in the new framework for SVFs (CFR Rec 6)
- To take into account rapid developments in the market regulators should be able to designate SVFs to apply higher risk regulation (CFR Rec 10) (PSR Rec 6)
- Definition of payments system in the *Payment Systems (Regulation) Act 1998* (Cth) be amended to include emerging payments systems and platforms (JPC Rec 8) (PSR Rec 6)
- A defined list of payment functions that require regulation should be developed (PSR Rec 8)

⁷³ In Australia the Reserve Bank of Australia is working with The Bank for International Settlements Innovation Hub, Bank Negara Malaysia, Monetary Authority of Singapore and South African Reserve Bank to test the use of CBDCs for international settlements through Project Dunbar, which aims to develop prototype shared platforms for cross-border transactions using multiple CBDCs, eliminating the need for intermediaries and cutting the time and cost of transactions; The Reserve Bank of Australia is partnering with CBA, NAB, Perpetual and ConsenSys Software on a project to explore the potential use and implications of wholesale market participants using a tokenised form of CBDC for the funding, settlement and repayment of a tokenised syndicated loan using distributed ledger technology; The Senate Select Committee on Australia as a Technology and Financial Centre has released its final report and recommends that the Treasury lead a policy review of the viability of a retail central bank digital currency in Australia (Rec 8).

⁷⁴ Commonwealth of Australia, Select Senate Committee on Australia as a Technology and Financial Centre Final Report (October 2021), ix.

⁷⁵ For example, John Crawford, Lev Menand & Morgan Ricks, 'FedAccounts: Digital Dollars' (2021) 89 *George Washington Law Review* 113; Damian Cyman, Elizaveta Gromova & Edvardas Juchnevicius 'Regulation of Artificial Intelligence in BRICS and the European Union' (2021) VIII(1) *BRICS Law Journal* 87; Albert Yuen Avinash Hotchandani 'Digital tokens and digital payments regulation in APAC - insights from Hong Kong, Singapore and Australia' (2020) 23(1) *Internet Law Bulletin* 10-16; Adam J Levitin 'Pandora's Digital Box: The promise and perils of digital wallets' (2018) 166(2) *University of Pennsylvania Law Review* 305-376; Matthew W Swinehart 'Modelling Payments Regulation and Financial Change' (2018) 67 *University of Kansas Law Review* 83; Jimenez, Maria Nieves Jimenez, 'Payment Services Evolution: From the European Directive of 2007 to the Digital Single Market and the European Directive of 2015' (2016) 5(5) *Journal of European Consumer and Market Law* 219-221; Maphuti B Tuba, 'The Technology-Neutral Approach and Electronic Money Regulation in the EU: identifying the Promises and Challenges for Future Regulation in South Africa' (2014) 47 *Comparative & International Law Journal South Africa* 372.

⁷⁶ Parliamentary Joint Committee on Corporations and Financial Services, *Mobile Payment and Digital Wallet Financial Services*, (Report, October 2021); Senate Select Committee on Australia as a Technology and Financial Centre *Final Report* (October 2021) (Reserve Bank of Australia, *Review of Retail Payments Regulation* (Issues Paper, November 2019, Consultation Paper, May 2021 and Conclusions Paper, October 2021); Commonwealth Government, *Payment Systems Review: From System to Ecosystem* (December 2020, Final Report, August 2021); Council of Financial Regulators, *Regulation of Stored-value Facilities in Australia: Conclusions of a Review by the CFR* (October, 2019); Productivity Commission, *Competition in the Australian Financial System Inquiry Report No 89*, 29 June 2018; Commonwealth, *Financial System Inquiry* (Final Report, November 2014).

⁷⁷ *Ibid.*

⁷⁸ Significant architectural changes to the mandate of regulators discussed in these reports are not included in this list.

- Treasury should consult with agencies on regulating payment platform providers (JPC Rec 9)
- ACCC should investigate Apple's restrictions on direct third-party access to chips that enable mobile payments (JPC Rec 10) (PSR Rec 7)

To summarise, a vast number of policy recommendations have been made which would impact on digital payments, although much of it is directed to cleaning up the current quagmire of payments regulation. Having said that, the recommendations are also designed to remove barriers to digital solutions. Current payments regulation has not been a barrier to the introduction of low friction payments in NSW such as the Opal card and the direct use of debit and credit cards. In relation to the latter, issuers have banking licences or are otherwise authorised or exempted. The current literature suggests, however, that scrutiny of this area should be maintained to determine whether any sweeping changes are implemented and whether the changes present opportunities or difficulties in short to medium term. Indeed, frameworks for CDR within transport and platforms should provide a better regulatory environment for MaaS systems.

6: Competition Policy and Law

Four aspects of competition law have been identified in the European literature as relevant in the public transport field and very relevant for the development of MaaS systems and frictionless ticketing.⁷⁹ These are:

- Access to essential services (Part IIIA of the *Competition and Consumer Act 2010* (Cth)),
- Bid rigging (Div 1 of Part IV),
- Anti-competitive arrangements (s 45) and
- Use of market power (s 46).

Even the existing ticketing systems are provided on the basis of public tender and accordingly the tender process should be monitored for bid rigging or exclusionary conduct—as they no doubt are.⁸⁰ However, the other competition issues come much more to the fore when future possible market structures, including those incorporating disruptor technologies, are considered. Were independent internet platforms to become involved, market power is likely to be endemic. Even if Transport were to offer a product covering ride sharing and other modalities of transport, it could be thought to be exercising its market power were it to cause independent ticketing arrangements to fail. Generally, the complexity of transport arrangements, vertical integration and use of market power to restrict competition might lead to outcomes which breach the requirements of competition law.⁸¹

Market design will be a complex yet crucial matter. There are many variations in which Transport can take any of a number of functions, from retreating to being a regulator to being the monopoly provider of fare collection services for all modalities of public transport, and many possibilities in between. Disruptor technology is sure to play a part, as the Uber story demonstrates. In many of these, Transport could be viewed as carrying on a business, noting that under the *Competition and Consumer Act 2010* (Cth) s 2B, Parts IV and V apply to the Crown in the right of the States and an authority of the State (of NSW) does not escape prosecution by reason of its government function. The question is solely one of the impact of behaviours in markets.

Current government policy requires that competition principles should be taken into account when designing the system to ensure contestability of markets. Transport ticketing systems can easily take the form of monopoly infrastructure which enhances the possibility of competition issues; such systems may not necessarily be owned by Transport if corporatisation and privatisation sweeps through public transport. Similarly, intellectual property protection can restrict contestability or create barriers to entry into markets: to some extent this is ameliorated by access to essential facilities considerations. Without due care, a MaaS platform (although not a pilot scheme) could involve restrictive agreements, exclusive dealing and market power of participants. Such issues are currently popping up in the literature.⁸²

Device-centric forms of frictionless payment, bank specific payment apps, and payment tied to specific payment networks can raise competition issues.⁸³ Surveys estimate that Apple has nearly 56% of the mobile

⁷⁹ Boitani, Andrea and Nicolini, Marcella and Scarpa, Carlo, Do Competition and Ownership Matter? Evidence from Local Public Transport in Europe (February 22, 2010). FEEM Working Paper No. 9.2010, Available at SSRN: <https://ssrn.com/abstract=1557151> or <http://dx.doi.org/10.2139/ssrn.1557151>; Martinez, Marcello and Canonico, Paolo, Organization of Public Transport Authorities and the Competition within Public Transport Services Markets (2006). *Organizzazione, Regulation and Competitiveness (Organizzazione, Regolazione, Competitività)*, R. Mercurio, ed., McGraw Hill, 2006, Available at SSRN: <https://ssrn.com/abstract=2015385>; See also the My Corridor report: http://www.mycorridor.eu/wp-content/uploads/2021/01/MyCorridor_D7.4_Analysis-of-legal-and-regulatory-barriers-in-MaaS_Final.pdf

⁸⁰ Miguel Amaral, Stéphane Saussier, Anne Yvrande-Billon, 'Auction Procedures and Competition in Public Services: The Case of Urban Public Transport in France and London' https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1109115; Hensher, David A, 'Regulatory frameworks in public transport including tendering', in Mulley, C., Nelson, J.D., & Ison, S. (Eds.). (2021). *The Routledge Handbook of Public Transport* (1st ed.). Routledge.

⁸¹ Martinez, Marcello and Canonico, Paolo, Organization of Public Transport Authorities and the Competition within Public Transport Services Markets (2006). *Organizzazione, Regulation And Competitiveness (Organizzazione, Regolazione, Competitività)*, R. Mercurio, ed., McGraw Hill, 2006, Available at SSRN: <https://ssrn.com/abstract=2015385>

⁸² Ibid.

⁸³ Parliamentary Joint Committee on Corporations and Financial Services, *Mobile Payment and Digital Wallet Financial Services*, (Report, October 2021), 49.

operating system market and Google is claiming a 43% market share.⁸⁴ The RBA has noted the question of access to the near-field communication (NFC) chip on Apple devices for use of its digital wallets as have retailer industry groups and financial institutions.⁸⁵ The policy issues raised by the literature include whether Apple should be forced to grant third party access to its NFC antenna, and more generally 'how might payment platform providers be included within existing payment system regulation'? The Joint Senate Committee on Financial Services has recommended Treasury consults relevant agencies to provide advice on these issues.⁸⁶

⁸⁴ Ibid, 51.

⁸⁵ Ibid, 49,61-71.

⁸⁶ Ibid 70.

7. Platform Regulation

MaaS generally involves an internet platform through which transport service providers are introduced to and interact with customers.⁸⁷ A well-known example of such a platform is the Uber app. A platform, Placie, integrating multimodal journeys was recently launched in Australia.⁸⁸

There is some European Union (EU) literature on the question of the regulation of these platforms as to their interactions with customers and on the relationship with transport service providers.⁸⁹ The thrust of discussion is to ensure plain and transparent contracting with service operators, the application of consumer law, transparent ranking processes (the *Trivago Case*⁹⁰ is relevant here), transparent data access and use practices, transparent terms of use and pricing mechanisms and effective suspension and complaints handling procedures.

⁸⁷ van den Berg, Vincent A.C. and Meurs, Henk and Verhoef, Erik, Business Models for Interoperable Mobility Services (August 18, 2020). Tinbergen Institute Discussion Paper 2020-051/VIII, Available at SSRN: <https://ssrn.com/abstract=3677899> or <http://dx.doi.org/10.2139/ssrn.3677899>; Liz Bizgan, Polly Hollings and Matt Reynolds, *Mobility as a Service – Acceptability Research* Department of Transport (UK), April 2020; Ho, Hinh Q., David A. Hensher, Daniel J. Reck, Sam Lorimer, Ivy Lu, 'MaaS bundle design and implementation: Lessons from the Sydney MaaS trial' (2021) 149 *Transportation Research Part A: Policy and Practice*, Volume 149, 339-376; Strikkers, S.A.I., 'The Dutch Mobility Transition: An Assessment of Governance Factors Contributing to Successful Implementation of MaaS in The Netherlands 'A qualitative research analyzing governance factors regarding the seven MaaS pilots, gaining insights for national implementation'' Masters thesis, Utrecht University

⁸⁸ <https://its-australia.com.au/news/placie-launches-australian-first-mobility-app/>

⁸⁹ Osborne Clarke LLP, *Mobility as a Service in a multimodal European cross-border Corridor (MyCorridor)* 17 Dec 2020, Delivery 7.4 for the European Commission, Analysis of legal and regulatory barriers in MaaS,

⁹⁰ *ACCC v Trivago N.V.* [2020] FCA 16. Trivago was and is a comparison site for accommodation prices. Trivago was held to mislead consumers by representing that it would help consumers find the cheapest rate for accommodation when its algorithms in fact compared standard rooms with luxury rooms, and highlighted accommodation which paid Trivago more in fees.

8: Interoperability and Standards

As the complexity of a frictionless ticketing system increases and develops into a MaaS system, so also does the need to ensure the standardisation and technical interoperability of diverse systems.⁹¹ This will be exacerbated as systems reach into different jurisdictions. The obvious historical example in Australia of this type of problem is rail gauges.⁹² Accordingly standards and protocols⁹³ are required, not only for integration of systems but also when seeking third party solutions. This is well understood in the literature as discussed in Intelligent Transport System (ITS) Australia's recent discussion paper on MaaS data sharing protocols (ITS Australia paper).⁹⁴ Indeed, external parties, such as Cubic, may well provide much of the data required for the system and the data will need to be made accessible across the system. It will also to be subject to privacy, interoperability, standards, and property right restrictions, including clear lines of responsibility and liability. Considerations of Europe-wide MaaS have raised these issues, both as to interjurisdictional compatibility and with regard to the various separate parties involved (transport operators, platforms, ticketing solutions and so forth).⁹⁵ Transport is obviously aware of this issue⁹⁶ as is the NSW government more broadly, see for example, NSW's guiding principle on standards for the internet of things which encourages IT solutions that use Australian or international standards or are open systems to avoid Vendor lock.⁹⁷

As the focus on this literature review is on legal issues of frictionless ticketing, and overall regulatory design, we have not surveyed the literature to update any technical protocols discussed in the ITS Australia paper. However, a key question discussed in the development of technical protocols for MaaS systems is the style of regulatory approach, which is referenced in that paper. The key question is whether governments lead regulation of standards and protocols by mandate or whether standards and protocols develop out of 'business need'. This bifurcation reflects different styles of regulation that might exist more broadly in a jurisdiction. Styles of regulation exist on a continuum and are generally a mix of state and private development. As a broad generalisation, different jurisdictions lean towards one end of the continuum or the other (France's style is more state-driven and command and control compared to the United States (US)). The style may differ again depending on the object of regulation (banking regulation is more likely to be prescriptive than nursing home regulation) and can change over time - depending on take up of new theories of regulation that appear in changing political and economic circumstances.⁹⁸ International standards bodies also have their own style, for example, the literature suggests they focus on expertise and processes that lead to consensus.⁹⁹

In relation to protocol regulation, the ITS Australia paper draws a distinction between the EU's approach to that of the United States, where the paper observes the EU protocols have a high level of governance

⁹¹ Osborne Clarke LLP, *Mobility as a Service in a multimodal European cross-border Corridor (MyCorridor)* 17 Dec 2020, Delivery 7.4 for the European Commission, Analysis of legal and regulatory barriers in MaaS,

⁹² Martin Scott, "'At all events on the through lines": The Century-long Journey to Australia's rail gauge unification' (2018) 104(1) *Journal of the Royal Australian Historical Society* 7-27

⁹³ While the terms 'standard' and 'protocol' are sometimes used interchangeably in the literature, put simply a 'standard' sets a high level policy (e.g. all devices will connect to the internet with the same connector) and a 'protocol' describes technical details of how to achieve the standard (e.g. all connectors will have X properties).

⁹⁴ ITS Australia, *Data sharing protocols, MaaS Discussion Paper* (Sep 2020).

⁹⁵ Osborne Clarke LLP, *Mobility as a Service in a multimodal European cross-border Corridor (MyCorridor)* 17 Dec 2020, Delivery 7.4 for the European Commission, Analysis of legal and regulatory barriers in MaaS

⁹⁶ See TfNSW, *Data Sharing specification for TfNSW MaaS* [date].⁹⁶

⁹⁷ NSW Government, *Internet of Things (IoT) Policy Statement 4* (Vers 1.1, Oct 9 2019).

⁹⁸ There is a vast literature on theories of regulation. A typical and well-known narrative for Australia is to describe a change from command and control regulation in the late 1970s to deregulatory or co-regulatory forms in the 1980s; discussions around 'new' ways of regulation apparently coinciding with changing political and economic norms. Ayres and Braithwaite and scholars surrounding them at the Australian National University were very influential in this regard. See, I. Ayres and J. Braithwaite, *Responsive Regulation: Transcending the Deregulation Debate*, Oxford University Press, New York, 1992.

⁹⁹ P Cihon Technical Report: Standards for AI Governance: International Standards to Enable Global Coordination in AI Research & Development (Oxford, Future of Human Institute, 2019) cited in Standards Australia, *An Artificial Standards Roadmap: Making Australia's Voices Heard Final Report* (2020), 32, 9.

compared to that of the US. It is suggested this is because the US protocols have developed out of ‘business need...adopted by other jurisdictions to become a de facto standard’.¹⁰⁰

In addition to technical discussions of the what and how to achieve interoperability, a key issue arising out of the literature in this area is how governance of protocols, standards and algorithms is to be managed. For Australia, while regional differences may exist,¹⁰¹ the question is what approach ‘would enable a core national data sharing protocol’?¹⁰²

¹⁰⁰ ITS Australia, Data sharing protocols, MaaS Discussion Paper (Sep 2020).

¹⁰¹ In part because of legacy systems and established patterns of use, Transport and Infrastructure Council, National Land Transport Technology Action Plan 2020-2023, 7

¹⁰² Ibid, 7.

'This clause provides that if:

- 1) a passenger uses an Opal card, or
- 2) any other 'ticket' (where the purchase money is payable to TfNSW directly or indirectly), or uses
- 3) an approved payment device (as narrowly defined)

to access a public passenger service (as defined), then the following results:

- 1) a contract is formed between the operator and the passenger *but not* TfNSW, and
- 2) TfNSW is not liable for:
 - a) anything done or omitted by the operator, or
 - b) for the carriage of the passenger, and
- 3) TfNSW is not taken to be in a relationship of principal and agent with the operator.'

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**Centre for Technology Infusion:
Technology and stakeholder
engagement:**

Erik van Vulpen
Mithlesh Meena
Aidin Bervan
Shuo Ding
Anupam Anusoni
Caitlin Cen
John Seymour
Jerry Chow
Prof. Aniruddha Desai

Legal and regulatory review:

La Trobe Law School

Hon Prof Ann Wardrop
Adjunct Prof David Wishart
Prof Louis de Koker

In collaboration with TfNSW:

Aisha Danjani
Damian Woodbridge
Eloise Murphy
Julie Prendergast
Kate Watts
Kurt Brissett
Mark Patterson
Matthew Jones
Michael Kane
Paula Gleeson
Rob Van Der Zalm
Sherri Fields
Stephanie Manning
Stuart Donohue
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Virginie Vernin

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Stroke Recovery Association
Vision Australia

Airport Link – Sydney’s Airport Train
Transdev Australasia
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Sydney Trains
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