Interoperability - the customer requirements and the commercial opportunity

TCF WG26 Report Skeleton

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Context of this Report Skeleton

- This skeleton reflects the discussion by Working Group 26 of the TCF at the meeting on 22 Jan 2015
  - For reference, an updated version of the Draft Scope and Terms of Reference is included in the following 3 slides
- The purpose of this report skeleton is to provide a framework for the working group to produce the draft report
  - Various stakeholders will need to be consulted to provide feedback, filling out a template slide for their relevant section
  - Details for the various schemes that exist will need to be completed, based on the template for each scheme
  - Owners within the working group will need to be assigned to other sections of the report

Interoperability - The customer requirements and the commercial opportunity

1.   Introduction

Interoperability means different things to different people. It may be determined by economic demand, geography, time, legislation, population and technology. It may be justified by with a commercial business case or only by macro-economic factors and political intent. The service level demands of customers vary with their social economic position, demographic group or by previous experience of themselves or their peer group. Transport scheme operators may find interoperability can bring benefits through economy of scales but may be regulated by different regional authorities with different contractual arrangements. The result is a variety of options which try to satisfy the business rules of each public transport scheme. Why one scheme should be interoperable with another may be very difficult to justify when developing the business case. This working group will try to answer the question as to why interoperability is needed in public transport ticketing.

2. Context and Scope

The public transport industry faces an ever growing choice of technological options for ticketing and payment. The potential benefits for customers and operators are enormous. However, the risks of wasted investment, disparate systems, conflicting commercial objectives and confused customers are significant and could lead to market paralysis. Moreover, the issues of private road transport such as infrastructure costs, growing urban populations, and environmental impacts have to be addressed by Government by trying to induce transport modal shift. It is clear that the free market approach to public transport schemes has brought benefits to services, but additional incentives and mandates from the Government may be required.

The DfT has led efforts to secure interoperability to date through the development of the ITSO specification and the publication of a Smart and Integrated Ticketing Policy. This work has laid the foundations for technical interoperability on a standardised smartcard platform. The challenge now is to marry the progress to date with rapidly evolving technology and diverse stakeholder requirements to achieve the benefits of interoperable ticketing whilst mitigating the associated risks.

This working group will review current levels of interoperability across ticketing schemes and assess the requirements of all stakeholders. Building on this, it will define an attainable and attractive interoperability target, and a roadmap and recommendations for achieving this target.

3. What is interoperability

Interoperability enables convenience for customers. Customers can choose the service which satisfies their needs without having to consider every mode or operator in the journey. Customers are accustomed to this level of convenience in other areas such as mobile telecoms and banking. A customer with a mobile phone can make calls just as easily to numbers on any other operator. A customer using a card issued by their bank can withdraw money at any cashpoint or to make card payments to any retailer that accepts card payments.

Operators and authorities can use the technology which meets their business needs. When different customers, operators and authorities chose different solutions, interoperability is the glue which ensures allows these choices to be accommodated without compromising functionality, convenience or security.

4. Report Scope and Structure

The working group will submit a report reflecting consideration of the following themes (which are likely to form the basis for the chapter headings in the report):

Section 1: An introduction to interoperability – *The what*

- What is interoperability?
- Issues around interoperability
  - Not a commercial given
- How do other related services approach interoperability (e.g. payment schemes , air travel, mobile phones etc.), and what lessons can be learned
- What did interoperability look like on "old technology" – cash & ticket

Section 2: An appraisal of the current situation:

- How much is multi-mode travel currently used
- A survey of existing interoperability schemes in this sector
  - Are there schemes outside the sector that could impact the transport sector/ ticketing
- What is the current level of interoperability between ticketing schemes? *[including all entitlement to travel]*
  - Include WG22 elements: parking, taxi, bike hire
- Technology context
  - Speed of change - What do we anticipate?

Section 3: Requirements and aspirations for interoperability – *The why*

- A survey of existing organisations concerned with interoperability in this sector
- The customer needs - what are the customer segments and what does each segment need from interoperable ticketing? How broad does the definition of ticketing have to be and how do the requirements change as interoperability gets broader
  - Include passenger here – need a view of customer/ passenger need
- The business case - Transport operator requirements
  - UK rail and bus
  - Car parking, cycle hire, taxis
- The national policy context - a synthesis of DfT's aspirations for interoperability.
- The local policy requirements - what do TfL, PTEs and local authorities need from interoperable ticketing and why, and to what extent, aren't they getting it at present?

Section 4: Delivering interoperability – *The how*

- Who can make this happen?
- The commercial requirement – what interoperable tickets need to be developed in cities and rural areas
- The customer proposition – what products need to be offered in order for schemes to be appealing to customers
- The business requirements – what are the data flows, reimbursement requirements, audits and controls necessary to deliver interoperability across these schemes
- What are the technology issues and barriers around interoperability? What is there already and what is just over the horizon to deliver front and back office interoperability?

Section 5: Planning for the future

- The target - Given where we are, customer needs, other stakeholder needs and what the technology can deliver, what is a realistic and attainable target for interoperability in transport by 2020?
    - "what does 'good' look like in 2020?"
- The interoperability roadmap – The target defines where we want to get to, so how do we get there with a realistic risk, funding and regulatory envelope?

Section 6: Conclusions and recommendations.

5. Working Group Structure

The working group will have three or four sub elements:

- Working group cohort – a collection of individuals representing all the key industry stakeholder areas which will meet every two months to consolidate findings and develop the target, roadmap and recommendations
    - Can we get ITSO, ATOC, RSP and PTEs represented?
- Subject matter forums: Specific forums in customer, operator, national and local policy needs and technological requirements to gather evidence for chapters 2-6 of the report. Likely 1-2 meetings.
- Contributors: All TCF members will be invited to contribute through an online questionnaire
- Working group research project team (subject to DfT funding) to consolidate primary and secondary research on current situation and stakeholder needs to shift the debate from informed opinion to hard fact
- If possible, we will use online tools (e.g. Huddle) to improve ease of participation and contribution

6. Timescales

- Interim report (Chap 1 - 6) issued by July 2015. Final report presented to TCF Conference Sept 2015
- Full project plan to be developed when membership and scope finalised

Contents

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Executive summary
XXX

- TBC at end of project

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Introduction to interoperability

- Executive summary

Introduction to interoperability	**X-X**

- The current situation

- Requirements and aspirations for interoperability

- Delivering interoperability

- Planning for the future

- Conclusions and recommendations

Issues around interoperability

The definition of interoperability

- Interoperability enables convenience for customers. Customers can choose the service which satisfies their travel needs without having to consider every mode or operator in the journey.

- Operators and authorities can use the technology which meets their business needs. When different customers, operators and authorities chose different solutions, interoperability is the glue which ensures allows these choices to be accommodated without compromising functionality, convenience or security.

A framework for considering needs

Key stakeholders →

	Operators	Individual customers	UK plc
Geographic			
Socio-economic			
Demographic			

(Axes of integration ↓)

Key issues

- Interoperability is not a commercial given, there are various trade-offs to consider
    - Costs vs. benefits
    - Competition vs. growth
    - Business needs vs. available technology
- If interoperability satisfies commercial needs, then it is something that we should expect the market to provide
- We set up a framework, considering levels of integration along three axes:
    - Geographic
    - Socio-economic
    - Demographic
- Key stakeholders will have different levels of motivation for ensuring that interoperability creates integration along these axes
    - If interoperability is about satisfying socio-economic or demographic needs, then it may require a local or national stakeholder to demand or specify it
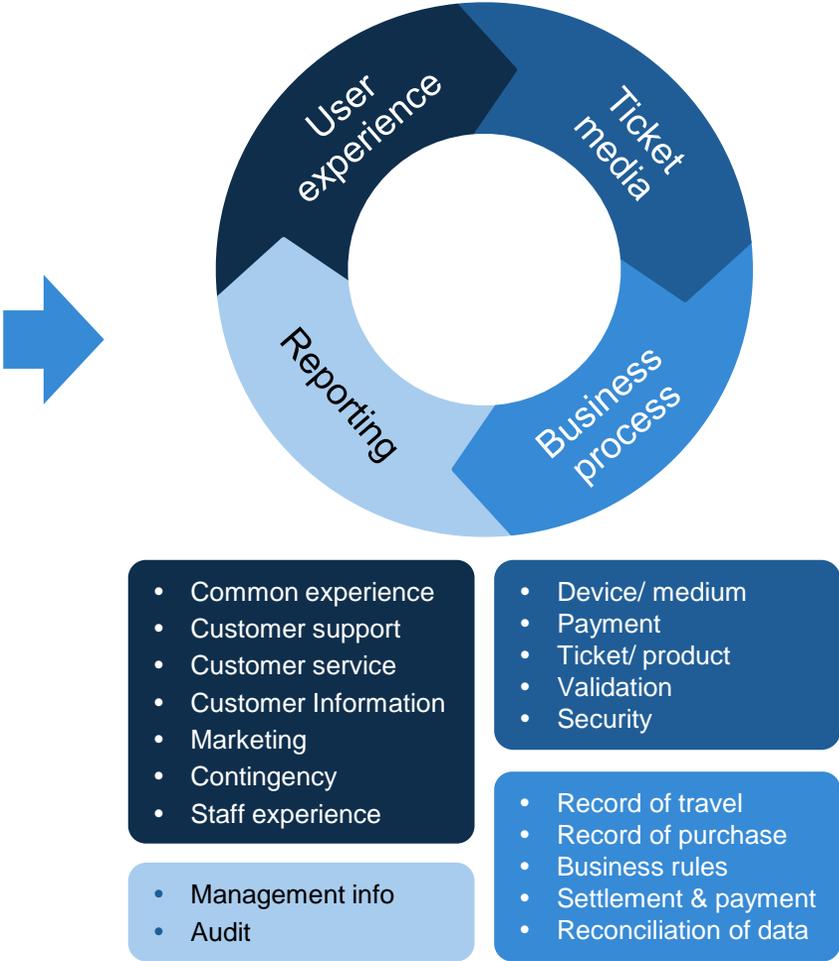
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Themes of interoperability

Key Themes of interoperability

- Interoperability is about more than just ticket media. It requires end-to-end interoperability and a common user experience
  - This entails multiple issues, crossing the themes of user experience, ticket media, business process and reporting
- For users, interoperability should enable convenience
- With interoperability, customers can choose the service which satisfies their needs without having to consider every mode or operator in the journey
  - cf. Banking, irrespective of bank used, can use bank card universally
  - cf. mobile phones, irrespective of operator, can call any number
- When different customers, operators and authorities choose different solutions, can interoperability be the glue which allows these choices to be accommodated without compromising functionality, convenience or security

The wheel of interoperability

- Common experience
- Customer support
- Customer service
- Customer Information
- Marketing
- Contingency
- Staff experience

- Device/ medium
- Payment
- Ticket/ product
- Validation
- Security

- Management info
- Audit

- Record of travel
- Record of purchase
- Business rules
- Settlement & payment
- Reconciliation of data

Interoperability in other industries

Interoperability in the mobile phone industry

Scope	• A mobile phone user is able to call or text a number on any other operator, with no restriction – Payment by the user may vary and settlement rules apply
Relevant enablers	Case study to be completed
Lessons for the transport industry	

Interoperability in the banking industry

Scope	• A bank customer is able to withdraw money using an ATM operated by any other bank
	   – In some cases, the customer may have to pay for the use, settlement rules apply
	• Bank customers are able to make direct payments electronically to any other bank accound
	• A credit card user is generally able to use their card in any location that accepts card payments
	   – Some restrictions apply

Relevant enablers	Case study to be completed
Lessons for the transport industry	

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Interoperability before technology

- The existing 'cash and paper ticket' technology currently affords a fairly high level of interoperability
  - cash can be used everywhere
  - Paper tickets were widely used
- New technologies must offer demonstrably more interoperability for customers if they are to be considered truly interoperable
- Here we set out the current level of interoperability afforded by 'cash and paper ticket' technology

Area	Item	Status	Detail
User experience	Common experience		
	Customer support		
	Customer service		
	Customer Information		
	Marketing		To be completed
	Contingency		
	Staff experience		
Ticket media	Device/ medium		Cash / paper tickets
	Payment		Cash everywhere, Card payment where available
	Ticket/ product		Paper ticket
	Validation		Paper ticket checked Payment at point of travel
	Security		
Business process	Record of travel		
	Record of purchase		
	Business rules		
	Settlement & payment		
	Reconciliation of data		
Reporting	Management info		
	Audit		

Key: ✓ Universal / fully interoperable   (✓) Some interoperability   ✗ Not interoperable

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The current situation

- Executive summary

- Introduction to interoperability

The current situation	**X-X**

- Requirements and aspirations for interoperability

- Delivering interoperability

- Planning for the future

- Conclusions and recommendations

Current use of multi-mode travel

- Can we find some data on the current market
  - Average trip length
  - Average # modes
  - Average # changes
  - Average # operators
  - Smart phone penetration
- Adoption of smart ticketing
  - Any data on changes when smart tech has been introduced (e.g. Oyster)
- Potential data sources
  - National Travel Survey
  - Passenger Focus surveys
  - Other?

Interoperability of current schemes

- Introduce solutions/ technologies

  - How fast are these changing?

  - What do we anticipate?

- Can we say something about related services? – Mobile phones / air travel / payment schemes / bank cards

Transport network specific interoperable schemes

- ITSO
- RSP
- Oyster
- SEFT
  - Others?

Interoperable schemes potentially applicable to transport

- EMV
  - Others?

Interoperability of XXX

1x slide for each scheme

Scheme detail

Item	Detail
Scheme	
Owner	
set-up	
current use	
Key ref. site	
Open tech?	
Global use	
# users	
# journeys p.a.	
# transactions	
Key offer	
Role	
Rationale	

Area	Item	Status	Detail
User experience	Common experience		
	Customer support		
	Customer service		
	Customer Information		
	Marketing		
	Contingency		
	Staff experience		
Ticket media	Device/ medium		
	Payment		
	Ticket/ product		
	Validation		
	Security		
Business process	Record of travel		
	Record of purchase		
	Business rules		
	Settlement & payment		
	Reconciliation of data		
Reporting	Management info		
	Audit		

Key: ✓ Universal / fully interoperable   (✓) Some interoperability   ✗ Not interoperable

Interoperability of solutions – a summary

Area	Item	Schemes					Coverage
		ITSO	RSP	Oyster	SEFT	EMV	
User experience	Common experience						
	Customer support						
	Customer service						
	Customer Information						
	Marketing						
	Contingency						
	Staff experience						
Ticket media	Device/ medium						
	Payment						
	Ticket/ product						
	Validation						
	Security						
Business process	Record of travel						
	Record of purchase						
	Business rules						
	Settlement & payment						
	Reconciliation of data						
Reporting	Management info						
	Audit						

This table should summarise the tables preceding slides

Key: ✓ Universal / fully interoperable   (✓) Some interoperability   ✗ Not interoperable

Requirements and aspirations for interoperability

- Executive summary

- Introduction to interoperability

- The current situation

Requirements and aspirations for interoperability   **X-X**

- Delivering interoperability

- Planning for the future

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Why interoperability?

- Hypothesis: We need interoperability to sustain the public transport network
  - Operator
    - Reduces costs
  - Funder [LA / PTEs]
  - Travelling public
    - Reduces barriers to travel
- Meet different market segments
- Supports devolution / Localism
- Meet customer expectations
- Removes administrative boundaries
- Facilitates changes in technology

Stakeholders to consult

- DfT
- PTEs
- LAs
- TfL
- Customers (Ask Passenger Focus to represent customer views)
- Bus Operators
- Solution Suppliers
- System Suppliers
- Taxi operators
- Station parking operators

Requirements and aspirations for interoperability
XXX requirements for interoperability

Area	Item	Criticality	Requirements/ aspirations	Responsibility	Enablers/ Blockages
User experience	Common experience	High/ Medium/ Low			
	Customer support				
	Customer service		What is the requirement for this item?		
	Customer Information				
	Marketing			Who does the stakeholder feel is responsible for implementing this (if anyone)	
	Contingency				
	Staff experience				
Ticket media	Device/ medium				What things would enable this/ What things are currently blocking this?
	Payment				
	Ticket/ product				
	Validation				
	Security				
Business process	Record of travel				
	Record of purchase				
	Business rules				
	Settlement & payment				
	Reconciliation of data				
Reporting	Management info				
	Audit				

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Requirements and aspirations for interoperability

Overview of requirements for interoperability

Area	Item	Stakeholder									Overview
		DfT	PTE	LA	TfL	Customer (pass focus)	Bus operator	Rail operator	Supplier (solution)	Supplier (system)	
User experience	Common experience										
	Customer support										
	Customer service										
	Customer Information										
	Marketing										
	Contingency										
	Staff experience										
Ticket media	Device/ medium										
	Payment										
	Ticket/ product										
	Validation										
	Security										
Business process	Record of travel										
	Record of purchase										
	Business rules										
	Settlement & payment										
	Reconciliation of data										
Reporting	Management info										
	Audit										

This table should summarise the tables on the preceding slides

Key areas of interoperability for stakeholders are…

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Gaps in current solutions and their criticality

Area	Item	Stakeholder requirement	Scheme coverage	Gap criticality	Enablers/barriers
User experience	Common experience				
	Customer support				
	Customer service				
	Customer Information				
	Marketing				
	Contingency				
	Staff experience				
Ticket media	Device/ medium				
	Payment			Gap analysis	
	Ticket/ product				
	Validation				
	Security				
Business process	Record of travel				
	Record of purchase				
	Business rules				
	Settlement & payment				
	Reconciliation of data				
Reporting	Management info				
	Audit				

Critical gaps in current schemes exist… with potential enablers/ barriers

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Delivering interoperability

- Executive summary

- Introduction to interoperability

- The current situation

- Requirements and aspirations for interoperability

Delivering interoperability   **X-X**
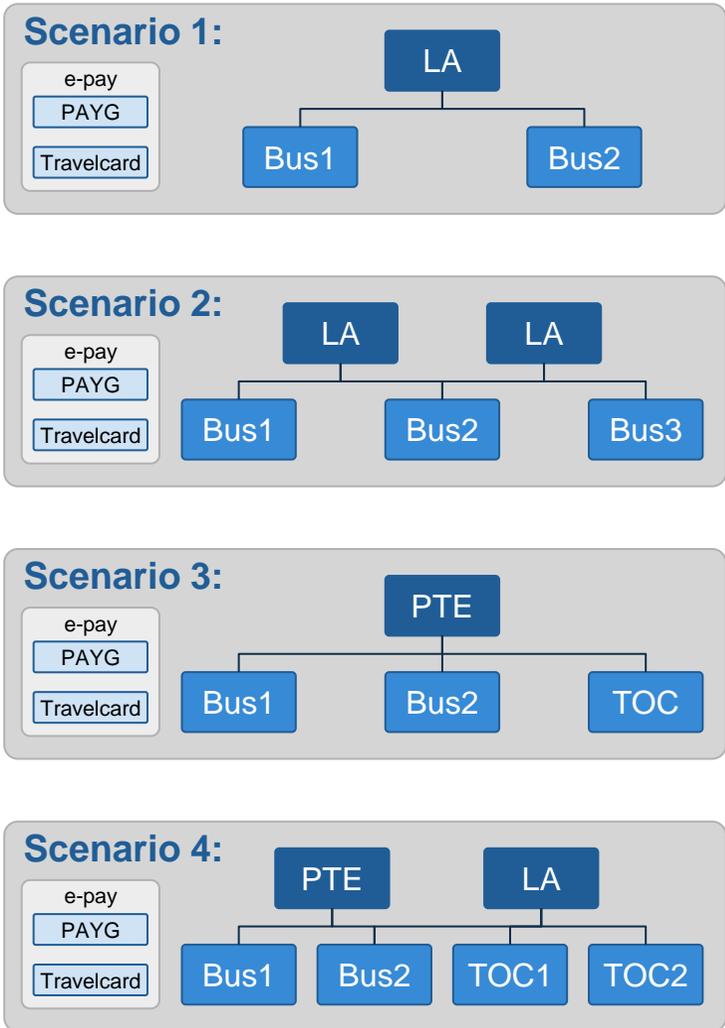
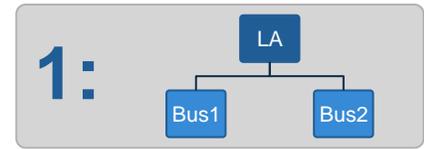- Planning for the future

- Conclusions and recommendations

Statement of requirements across scenarios

- In order to understand what it would take to deliver interoperability, and who is going to be motivated to drive delivery, we build up four scenarios of increasing complexity

  - **Scenario 1:** one LA and two Bus operators

  - **Scenario 2:** two LAs and three Bus operators, with one bus operator straddling the two

  - **Scenario 3:** one PTE, two Bus operators and a TOC (c.f. Liverpool)

  - **Scenario 4:** one PTE and one LA, with two Bus operators and two TOCs (c.f. Manchester)

- In these scenarios, we look at the requirements by key stakeholder across the different axes of integration and consider the business cases for interoperability that arise

Key stakeholders

	Operators	Individual customers	UK plc
Geographic			
Socio-economic			
Demographic			

Axes of integration

Scenario 1:
e-pay / PAYG / Travelcard — LA — Bus1, Bus2

Scenario 2:
e-pay / PAYG / Travelcard — LA, LA — Bus1, Bus2, Bus3

Scenario 3:
e-pay / PAYG / Travelcard — PTE — Bus1, Bus2, TOC
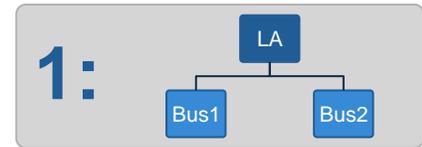
Scenario 4:
e-pay / PAYG / Travelcard — PTE, LA — Bus1, Bus2, TOC1, TOC2

Scenario 1: 1 LA & 2 Bus operators [1 of 2]

1:

- Set up scenario

- Understand what the interoperability requirements would be across the wheel of interoperability

- Refer back to the framework

  – Understand requirements by key stakeholder and across different axes of integration
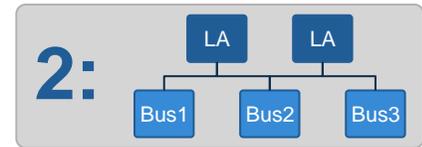
Key stakeholders

Axes of integration

	Operators	Individual customers	UK plc
Geographic			
Socio-economic			
Demographic			

Scenario 1: 1 LA & 2 Bus operators [2 of 2]

1:

Area	Item	Criticality	Requirements/ aspirations	Responsibility	Enablers/ Blockages
User experience	Common experience				
	Customer support	High/ Medium/ Low			
	Customer service				
	Customer Information		What is the requirement for this item?		
	Marketing				
	Contingency			Who is likely to be responsible for implementing this?	
	Staff experience				
Ticket media	Device/ medium				What things would enable this/ What things could block this?
	Payment				
	Ticket/ product				
	Validation				
	Security				
Business process	Record of travel				
	Record of purchase				
	Business rules				
	Settlement & payment				
	Reconciliation of data				
Reporting	Management info				
	Audit				

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Scenario 2: 2 LAs & 3 Bus operators [1 of 2]
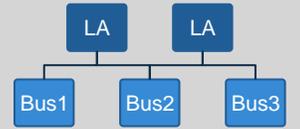
2:

- Set up scenario

- Understand what the interoperability requirements would be across the wheel of interoperability

- Refer back to the framework

  - Understand requirements by key stakeholder and across different axes of integration

Key stakeholders →

Axes of integration ↓

	Operators	Individual customers	UK plc
Geographic			
Socio-economic			
Demographic			

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Scenario 2: 2 LAs & 3 Bus operators [2 of 2]

2:

Area	Item	Criticality	Requirements/ aspirations	Responsibility	Enablers/ Blockages
User experience	Common experience	High/ Medium/ Low			
	Customer support				
	Customer service				
	Customer Information		What is the requirement for this item?		
	Marketing				
	Contingency			Who is likely to be responsible for implementing this?	
	Staff experience				
Ticket media	Device/ medium				What things would enable this/ What things could block this?
	Payment				
	Ticket/ product				
	Validation				
	Security				
Business process	Record of travel				
	Record of purchase				
	Business rules				
	Settlement & payment				
	Reconciliation of data				
Reporting	Management info				
	Audit				

Scenario 3: 1 PTE, 2 Bus operators & 1 TOC [1 of 2]

3:

PTE

Bus1 | Bus2 | TOC

- Set up scenario

- Understand what the interoperability requirements would be across the wheel of interoperability

- Refer back to the framework

  – Understand requirements by key stakeholder and across different axes of integration

Key stakeholders →

Axes of integration ↓

	Operators	Individual customers	UK plc
Geographic			
Socio-economic			
Demographic			

Delivering interoperability
Scenario 3: 1 PTE, 2 Bus operators & 1 TOC [2 of 2]

3: PTE — Bus1 Bus2 TOC

Area	Item	Criticality	Requirements/ aspirations	Responsibility	Enablers/ Blockages
User experience	Common experience	High/ Medium/ Low			
	Customer support				
	Customer service				
	Customer Information		What is the requirement for this item?		
	Marketing				
	Contingency			Who is likely to be responsible for implementing this?	
	Staff experience				
Ticket media	Device/ medium				What things would enable this/ What things could block this?
	Payment				
	Ticket/ product				
	Validation				
	Security				
Business process	Record of travel				
	Record of purchase				
	Business rules				
	Settlement & payment				
	Reconciliation of data				
Reporting	Management info				
	Audit				

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Scenario 4: 1 PTE, 1 LA, 2 Bus operators & 2 TOCS [1 of 2]

4:

PTE	LA

| Bus1 | Bus2 | TOC1 | TOC2 |

- Set up scenario

- Understand what the interoperability requirements would be across the wheel of interoperability

- Refer back to the framework

    – Understand requirements by key stakeholder and across different axes of integration

Key stakeholders →

Axes of integration ↓

	Operators	Individual customers	UK plc
Geographic			
Socio-economic			
Demographic			

Scenario 4: 1 PTE, 1 LA, 2 Bus operators & 2 TOCS [2 of 2]

4:

Area	Item	Criticality	Requirements/ aspirations	Responsibility	Enablers/ Blockages
User experience	Common experience	High/ Medium/ Low			
	Customer support				
	Customer service				
	Customer Information		What is the requirement for this item?		
	Marketing				
	Contingency			Who is likely to be responsible for implementing this?	
	Staff experience				
Ticket media	Device/ medium				What things would enable this/ What things could block this?
	Payment				
	Ticket/ product				
	Validation				
	Security				
Business process	Record of travel				
	Record of purchase				
	Business rules				
	Settlement & payment				
	Reconciliation of data				
Reporting	Management info				
	Audit				

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Planning for the future

- Executive summary

- Introduction to interoperability

- The current situation

- Requirements and aspirations for interoperability

- Delivering interoperability

Planning for the future	**X-X**

- Conclusions and recommendations

The target

- Given where we are, customers needs, stakeholder needs and what the technology can deliver, what is a realistic and attainable target for interoperability in transport by 2020?

  - "what does 'good' look like in 2020?"

The roadmap

- The target defines where we want to get to

  - So how do we get there with a realistic risk, funding and regulatory envelope

Conclusions and recommendations

- Executive summary

- Introduction to interoperability

- The current situation

- Requirements and aspirations for interoperability

- Delivering interoperability

- Planning for the future

Conclusions and recommendations	X-X

Conclusions and recommendations
XXX

- TBC