# STPR

## STRATEGIC
## **TRANSPORT**
## PROJECTS
## REVIEW

PROTECTING OUR CLIMATE
AND IMPROVING LIVES

## Appendix I: Recommendation Appraisal Summary Tables

### December 2022

**Jacobs**  **AECOM**

# 1. Detailed Appraisal Summary

An 'Appendix I: Recommendation Appraisal Summary Tables (ASTs) Explanatory Note' accompanies this AST.

## 1.1. Recommendation 23 – Smart, integrated public transport ticketing

**Recommendation Description**

Making it easier for people to reach their end destination by simplifying how they store and pay for tickets with different providers makes public transport a more convenient, flexible and attractive travel option. This encourages people to switch from private car use and supports more sustainable travel.

Improving integration involves introducing new services, technologies and systems which support easier payment and the opportunity to simplify fares, such as price capping. To fully integrate this across all operators, this can include electronic payment, smartcard and mobile technologies coupled with improved back-end administration systems.

This recommendation builds on the interventions and new services delivered under the '2018 Smart and Integrated Ticketing & Payments Delivery Strategy' to continue with the support and ongoing delivery of fully integrated smart ticketing and payment services across all public transport modes, to promote modal shift and encourage active travel.

This recommendation supports the delivery of the provisions, and subsequent workstreams within the Transport (Scotland) Act 2019, which includes establishing a National Smart Ticketing Advisory Board and setting a technological standard for smart ticketing.

The Act also seeks to enhance integrated schemes to now include connecting modes and further empower Scottish Local Authorities to introduce smart and integrated ticketing schemes where there is consumer demand, enabling access to and use of more sustainable public transport.

## 1.2. Relevance

**Relevant to trunk road and motorway network**

The delivery of new services and technologies for smart and integrated ticketing across Scotland has the potential to increase the attractiveness of sustainable travel options by removing barriers to access in the form of simplification of ticket purchasing, contributing to addressing key problems for Scotland including the climate emergency and social inequality.

Continued implementation of Transport Scotland's 2018 Smart and Integrated Delivery Strategy in conjunction with the provisions in the Transport (Scotland) Act 2019 provide the basis for establishing the technology and data platforms, data rules and financial agreements. Continuity of support for this recommendation is required to achieve a smart and integrated public transport ticketing system; that would make full use of new services, enhanced data sets and new technologies, which all play a key role in making Scotland's public transport networks simpler, more convenient, flexible and attractive for passengers.

## 1.3. Estimated Cost

| **£51 million – £100 million Capital** |
| --- |
| Capital cost for smart, integrated public transport ticketing would be expected to range from £51 million - £100 million. |
| Ongoing costs for the concessionary >60 and <22 year olds is excluded from this figure. |

## 1.4. Position in Sustainable Investment Hierarchy

| **Reducing the Need to Travel Unsustainably** |
| --- |
| The recommendation would contribute to seven of the 12 NTS2 outcomes, as follows: <br><br> ▪ Be easy to use for all; <br> ▪ Be affordable for all; <br> ▪ Help deliver our net-zero target; <br> ▪ Promote greener, cleaner choices; <br> ▪ Get people and goods where they need to get to; <br> ▪ Use beneficial innovation; and <br> ▪ Enable us to make healthy travel choices. |

## 1.5. Summary Rationale

**Summary of Appraisal**

|  | TPO | | | | | STAG | | | | | SIA | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| **Low Scenario** | ++ | ++ | + | ++ | + | + | ++ | + | ++ | ++ | + | + | + | + | + |
| **High Scenario** | ++ | ++ | + | ++ | + | + | ++ | + | ++ | ++ | + | + | + | + | + |

This recommendation would make it easier for people to reach their end destination by simplifying how they purchase and store tickets with different providers, in turn, enhancing the convenience, flexibility and attractiveness of public transport options across Scotland. This would encourage people to switch from private car use and supports more active travel and sustainable transport options, as part of a multi-modal journey.

This recommendation makes an overall positive contribution to the STPR2 Transport Planning Objectives (TPOs), STAG criteria, and the Statutory Impact Assessment (SIA) criteria.

Details behind this summary are discussed in Section 3, below.

# 1. Context

## 1.1. Problems and Opportunities

This recommendation could help to address the following problems and opportunities:

| Relevant Problem & Opportunity Themes Identified in National Case for Change |
| --- |
| <ul><li>**Changing Travel Behaviour:** changing people's travel behaviour to use more sustainable modes will have a positive impact on the environment, as well as health and wellbeing.</li><li>**Decline in Bus Use:** bus is particularly important to areas which are not served by the rail network, including much of urban and rural Scotland. It can be an important element in multi-modal journeys and is a sustainable and space-efficient mode of travel. Reducing passenger numbers risks driving down revenues and making some services unviable, resulting in cancellations and, in some cases, communities being isolated .</li><li>**Poverty and Child Poverty:** public transport is very important to those on low incomes, yet in many areas of high social deprivation public transport options can be limited and relatively expensive. A key challenge is providing fair and affordable access to the services people need.</li><li>**The Changing Transport Needs of Young People:** key issues for young people include the availability of public transport, particularly to further and higher education, and personal safety when using services .</li><li>**Meeting the Needs of an Ageing Population:** older people are healthier, fitter, wealthier and more mobile compared with previous generations: they are likely to want to travel more and the transport system needs to ensure older people, wherever they live, are not socially isolated.</li><li>**Global Climate Emergency:** the Scottish Parliament committed to an ambitious target of net zero emissions by 2045 and transport needs to play its part. Transport is currently Scotland's largest sectoral emitter, responsible for 37% of Scotland's total greenhouse gas emissions (greenhouse gas emissions encompass $CO_2$ emissions)  in 2018 (National Atmospheric Emissions Inventory 1990-2017) . Our transport system needs to minimise the future impacts of transport on our climate</li><li>**Labour Markets:** people often need transport to access employment, education and training and therefore help reduce the numbers out of work and support Scotland's ambitions for growth. Transport can ensure that the skills and experience of those in the labour force are effectively matched with the needs of businesses, helping to increase incomes and improve productivity.</li><li>**Tourism:** transport plays a vital part in supporting tourism. It enables people to get to, and travel within, Scotland and allows them to explore the many sights and experiences the country has to offer. Whilst tourism benefits are recognised, tourists should be encouraged to travel using sustainable modes.</li><li>**Physical Activity:** the importance of active travel is becoming more evident as the consequences of physical inactivity are studied. It is recognised that one of the most effective ways to secure the required 30 minutes of moderate activity per day is to reduce reliance on motorised transport, changing the means of everyday travel to walking and cycling .</li></ul> |

## 1.2. Interdependencies

This recommendation has potential overlap with other STPR2 recommendations and would also complement other areas of Scottish Government activity.

| **Other STPR2 Recommendations** |
| --- |
| <ul><li>Behavioural change initiatives (6);</li><li>Clyde Metro (11);</li><li>Edinburgh & South East Scotland Mass Transit (12);</li><li>Aberdeen Rapid Transit (13);</li><li>Supporting integrated journeys at ferry terminals (18);</li><li>Investment in Demand Responsive Transport and Mobility as a Service (20);</li><li>Improved public transport passenger interchange facilities (21); and</li><li>Framework for the delivery of mobility hubs (22).</li></ul> |
| **Other areas of Scottish Government activity** |
| <ul><li>The Programme for Government 2022/23 commitments for Innovation / Smarter travel</li><li>The '2018 Smart and Integrated Ticketing & Payments Delivery Strategy' – building on the interventions and new services delivered .</li><li>The 2019 Transport (Scotland) Act - which aims to establish a National Smart Ticketing Advisory Board and set a technological standard for smart ticketing .</li><li>Collectively, the Act and Strategy combine to provide the basis for enhancing the technology, data platforms and open data rules. This would help authorities to reach the commercial agreements required to support the establishment of local smart ticketing schemes. Scottish Local Authorities have been further empowered to introduce smart ticketing schemes where there is consumer demand.</li></ul> |

# 2. Appraisal

This section provides an assessment of the recommendation against:

- STPR2 Transport Planning Objectives (TPOs)
- STAG criteria
- Deliverability criteria
- Statutory Impact Assessment criteria.

The seven-point assessment scale has been used to indicate the impact of the recommendation when considered under the 'Low' and 'High' Transport Behaviour Scenarios (which are described in Appendix F of the Technical Report).

## 2.1. Transport Planning Objectives

**1. A sustainable strategic transport system that contributes significantly to the Scottish Government's net-zero emissions target**

| Low Scenario | High Scenario |
|:---:|:---:|
| ++ | ++ |

Smart and integrated ticketing, particularly if it leads to better value and simpler fares and payment, is likely to encourage more people onto public transport from less sustainable modes and thus support net-zero targets. One research study found that cost was seen as a barrier to switching from private car to bus . A 2011 study cited the reduction in boarding times as a result of both smart and integrated bus ticketing as having tangible value to passengers. This would be expected to support travel behaviour change from private cars toward bus (and rail).

Studies have estimated the increase in public transport ridership due to integrated ticketing at between 4.5% and 20% . Higher patronage reduces operating costs per passenger and therefore lowers fares, making public transport even more attractive and encouraging further modal shift, creating a circle of growth .

This recommendation is therefore expected to have a moderate positive impact on this objective in both the Low and High scenarios.

**2. An inclusive strategic transport system that improves the affordability and accessibility of public transport.**

| Low Scenario | High Scenario |
|:---:|:---:|
| ++ | ++ |

Smart and integrated public transport ticketing can make transport more affordable, for example when using a smart card or mobile phone to pay, as it can allow for the best price to be calculated automatically .

The improved ease of payment can also help make public transport more accessible ; removing the need to work out the most appropriate ticket and have the correct change and making the payment interaction less stressful and suited to different people's needs.

This recommendation is therefore expected to have a moderate positive impact on this objective in both the Low and High scenarios.

---

**3. A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.**

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

The recommendation reduces financial and cognitive barriers to public transport use which reduces transport inequality and enables access to employment, education and healthcare .

Modal shift from car would reduce traffic flows, reducing accident risk, air pollution, and noise pollution. This would enhance communities as places, and would also make active travel more attractive, with potential health benefits from increased physical activity.

This recommendation is therefore expected to have a minor positive impact on this objective in both the Low and High scenarios.

---

**4. An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.**

| Low Scenario | High Scenario |
|:---:|:---:|
| ++ | ++ |

This recommendation has the potential to connect people with jobs and improve productivity.

Offering new types of products such as season tickets or ticket bundles/multi-ticket packs, including options which provide better value for multi-stage, multi-operator, or multi-modal journeys, would reduce the cost of travel.

This would have particular benefits for people on lower incomes and those who live in areas with poor connectivity and would therefore support sustainable inclusive growth.

This recommendation is therefore expected to have a moderate positive impact on this objective in both the Low and High scenarios.

---

**5. A reliable and resilient strategic transport system that is safe and secure for users.**

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

Smart and integrated ticketing provides greater journey options and flexibility should the "first best" option be delayed or cancelled. This would improve users' experience of network resilience.

This recommendation is therefore expected to have a minor positive impact on this objective in both the Low and High scenarios.

## 2.2. STAG Criteria

### 1. Environment

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

See Strategic Environmental Assessment (SEA) below.

This recommendation is expected to have a minor positive effect on this criterion in both the Low and High scenarios.

### 2. Climate Change

| Low Scenario | High Scenario |
|:---:|:---:|
| ++ | ++ |

Smart and integrated ticketing would encourage modal shift from private car travel to public transport and would therefore support efforts to reduce greenhouse gas emissions.

Studies have estimated the increase in public transport ridership due to integrated ticketing at between 4.5% and 20% .

The recommendation would not be anticipated to have any impacts against the assessment sub-criteria related to Vulnerability to the Effects of Climate Change and Potential to Adapt to the Effects of Climate Change.

This recommendation is expected to have a moderate positive impact on this criterion in both the Low and High scenarios.

### 3. Health, Safety and Wellbeing

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

Although this recommendation does not have a direct impact on transport infrastructure, it

is considered to have a minor positive effect against the safety criterion due to an expected modal shift from car to safer, public transport modes of travel.

This recommendation is expected to improve access to Health and Wellbeing Infrastructure by making trips more affordable and accessible, as well as encouraging more active travel by incorporating active travel modes in smart and integrated ticketing schemes and as part of a person's multi-modal journey.

The recommendation is not anticipated to have any impact on Security, Health and Visual Amenity.

This recommendation is therefore expected to have a minor positive impact on this criterion in both the Low and High scenarios.

## 4. Economy

| Low Scenario | High Scenario |
|:---:|:---:|
| ++ | ++ |

The recommendation supports access to employment, education, and leisure by increasing the ease of using public transport, and therefore is considered to have a positive impact against the Economy criteria.

A 2011 study estimated the marginal external benefits of the reduction in car use, such as congestion and accident benefits, as £64.9 million per annum (£34.9 million for bus and £30 million for rail) for integrated ticketing and £82.3 million for smart integrated ticketing (£52.3 million for bus and £30 million for rail).

The recommendation is not anticipated to have any impact on Wider Economic Impacts (WEIs).

Smart and integrated ticketing, by encouraging modal shift, also supports the economic growth of travel providers and businesses where car access/parking is limited.

Overall, this recommendation is expected to have a moderate positive impact on this criterion in both the Low and High scenarios.

## 5. Equality and Accessibility

| Low Scenario | High Scenario |
|:---:|:---:|
| ++ | ++ |

The recommendation has a positive impact on affordability given the opportunities that smart and integrated ticketing allows. This would help to increase fare options and flexibility and could allow for fare capping and multi-modal and multi-operator ticket schemes, engendering confidence in using the public transport network.

Additionally smart ticketing, and associated improved data provisions, would make people more aware of the cost of travel, allowing users to identify the ticket and journey most suitable for them.

It is expected that this would have particular benefits for people who live in deprived and access-deprived areas, by removing cost barriers to multi-stage, multi-operator, and multi-modal journeys.

There are also potential equality benefits; the recommendation helps to increase the flexibility and options for ticketing and payment, reducing the need to plan their travel in advance.

Smart and integrated ticketing helps to increase payment and ticketing options meaning there are more methods available to suit user's needs, for example reducing the need to deal with cash when boarding a bus or by providing new user interfaces to make purchasing a ticket easier. New systems do not necessarily replace existing forms of payment and ticketing, meaning journeys can still be made for those without access to a bank card or mobile device. Overall, this recommendation is expected to have a positive impact to transport accessibility.

The recommendation is not expected to have an impact on active travel network coverage, but would help to make active travel more integrated and accessible through smart and integrated ticketing and payment options.

Also refer to EqIA / ICIA / CRWIA / FSDA in the next section.

Overall, this recommendation is expected to have a moderate positive impact on this criterion in both the Low and High scenarios.

## 2.3. Deliverability

### 1. Feasibility

The feasibility scope of the recommendation is dependent on the technology adopted. If smart and integrated ticketing technology is deemed to be required, the cost would increase depending on the functionality required.

Elements of a smart ticketing approach has already been deployed in Scotland and full schemes have been successfully operating across the world including London (Oyster) and Hong Kong (Octopus). For example, fare capping and tap in tap out is available on certain bus routes in Scotland, and Scotrail offers mobile tickets.

For COP26 the Scottish Government provided a Travel Pass which meant all delegates and volunteers could travel free during the COP26 conference period. This interoperable, multi-modal smartcard was issued to over 28,000 delegates and enabled over 141,000 journeys to be made on bus, rail, tram and subway.

There are a range of technical, legal and commercial issues when more than one supplier of payment services is involved with the scheme; these issues would need careful consideration in the roll out of an area wide or national scheme.

Additionally, compared to London where TfL have control over all bus services, the bus industry in Scotland is deregulated introducing commercial complexities in introducing a desired integrated scheme.

A scheme for integrated ticketing across the north of England was recently abandoned, due to legal and commercial issues, which would be the key barriers to overcome in Scotland.

Introducing smart and integrated ticketing is technically feasible, however the link between maximising the feasibility and maintaining affordability may be a limiting factor.

### 2. Affordability

Smart and integrated ticketing could be delivered through an agreement between authorities and public transport operators at relatively low cost. Technological interventions that help to reduce fraud would increase costs considerably.

Additionally, introducing large scale smart and integrated ticketing schemes may increase costs, particularly if discounted fares were part of the scheme, and therefore requiring 'backfilling' by the funder.

One study found that the value for money was high for a number of integrated ticketing options, with benefit cost ratios (BCRs) in the range of 14.7 for integrated ticketing and 19.7 for smart integrated ticketing. It is noted in the report that these BCRs were, however, highly sensitive to changes in assumptions.

### 3. Public Acceptability

This recommendation is likely to receive widespread support by the public. Calls for an

"Oyster-style" ticketing system are often seen in the general press , and in specialist technical press . Transport for London's Oyster system is widely praised , indicating that public acceptability would likely be high.

## 2.4. Statutory Impact Assessment Criteria

### 1. Strategic Environmental Assessment (SEA)

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

This recommendation would likely result in positive effects on the SEA objectives related to reducing greenhouse gas emissions (Objective 1) and improving air quality (Objective 3), as Integrated Public Transport Ticketing is likely to encourage more people to use public transport than private vehicles, thereby reducing greenhouse gas and air pollutant emissions. In addition, the recommendation supports quality of life and sustainable accessibility (Objective 4), as smart and integrated ticketing would enable greater accessibility to essential services, employment and the natural environment.

A significant positive effect is assessed for Objective 8 as the recommendation would promote and improve the use of sustainable transport options through smart and integrated ticketing.

It is considered that there would be no significant effects on the remaining SEA objectives as the recommendation is unrelated. However, it is not assessed to result in any negative effects on the achievement of SEA objectives related to climate change adaptation (Objective 2), noise and vibration and safety (Objectives 5 and 7), natural resource usage, the water environment, biodiversity, soil, cultural heritage and landscape and visual amenity (Objectives 9 to 14).

Given the nature of the recommendation, it has no (or negligible) clear relationship to Objective 6 (high quality places).

This recommendation is therefore expected to have a moderate positive effect on this criterion in both the Low and High scenarios.

### 2. Equalities Impact Assessment (EqIA)

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

This recommendation has a potentially positive impact on accessibility and social inclusion through more flexible and smarter public transport fares and reduction in barriers to using public transport and taking multi-operator and multi-modal journeys. This recommendation helps to increase the flexibility and options for ticketing and payment, reducing the need to plan their travel in advance

Smart and integrated ticketing helps to increase payment and ticketing options meaning there are more methods available to suit user's needs, for example reducing the need to deal with cash when boarding a bus or by providing new user interfaces to make purchasing a ticket easier. New systems do not necessarily replace existing forms of

payment and ticketing, meaning journeys can still be made for those without access to a bank card or mobile device (such as older people and children). Overall, this recommendation is expected to have a positive impact to transport accessibility.

The design of new smart ticketing and payment systems should take these needs into account with the development of appropriate user guidance and alternative payment options available for those without access to a bank card or mobile device.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

---

## 3. Island Communities Impact Assessment (ICIA)

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

The recommendation is considered to have a positive impact on island communities due to the potential for supporting integrated journeys.

However, the requirements for integrated ticketing on islands is likely to differ due to the dispersed nature of island communities and the nature of public transport serving communities, for example a greater reliance on demand responsive transport services. Additionally, the availability of signal to use smart ticketing and payment should also be considered in island communities, where data connectivity may be more limited.

This recommendation is therefore expected to have a minor positive impact on this criterion in both the Low and High scenarios.

---

## 4. Children's Rights and Wellbeing Impact Assessment (CRWIA)

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

The recommendation is considered to have a positive impact on children and young people who would benefit from potential public transport costs savings as a result of integrated ticketing, although it is noted that such users already benefit from the recent (2022) introduction of the free bus travel for under 22s. However, the use of technology/apps and bank cards may exclude younger passengers and as such alternative options should be considered so that all can benefit.

Conversely, greater provision of service information and more options for ticketing and payment, including smart cards with preloaded tickets or funds, would help drive greater inclusivity, making public transport more accessible to young people.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

## 5. Fairer Scotland Duty Assessment (FSDA)

| Low Scenario | High Scenario |
|:---:|:---:|
| + | + |

The recommendation has the potential to have a positive effect on socio-economically disadvantaged groups through a reduction in barriers to accessing services such as employment and education by public transport.

However, use of technology/apps to access services may exclude some users without access to modern smart phones and as such actions seek to provide alternative options to ensure everyone would have access to services Therefore it is recognised that smart payment and ticketing only seeks to add inclusivity to tickets and payment as opposed to restricting it.

There is a need to consider barriers to the use of smart ticketing systems amongst groups who currently use cash payments for journeys and those who may find it difficult to obtain electronic forms of payment. The design of new systems should take these needs into account with alternative payment options available for those without access to a bank card or mobile device.

This recommendation is expected to have a minor positive impact against this criterion in both the Low and High travel behaviour variant scenarios.