Scottish transport review

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SCOTLAND'S TRANSPORT THINK TANK

COP26
Sustainable Transport Spending Plans
Electric Vehicle Policy and Charging

Editorial by STSG Chair John Yellowlees

Welcome to STR59 which looks back to the achievements of 2019 and forward to the biggest conference that Scotland has ever hosted, COP26 in Glasgow this November. 2019 was the year that the Aberdeen Western Peripheral Route finally opened but the Queensferry Crossing was revealed to be incomplete.

On the railways Queen Street Station got longer platforms, electric trains reached Dunblane, Alloa and Shotts, the restored Ferryhill Turntable brought steam specials to Aberdeen and Azumas made their debut on LNER - but Caledonian Sleeper had had torrid times with their new Mark 5 trains.

Prestwick Airport was up for sale, and Ferguson Marine had passed into public ownership, but there was no rescue for St Rollox Works and Stagecoach quit rail franchising.

Ryanair's withdrawal had resulted in the first fall for five years in Edinburgh Airport passenger figures, but the South of Scotland received a new option when Loganair began flying out of Carlisle Airport.

Bus competition started to heat up with Bright Bus hitting the streets of Edinburgh offering new services in the lucrative tourist market. Construction had just begun on the Tram extension to Newhaven.

STSG met with Chinese delegations from Kunming and Guangxi and we funded a paper by George Eckton on gender issues in transport. Our regular funding for student projects continued with support to Thomas Schonberger for research about the environmental impacts of sea versus air on routes on the west coast of Scotland. The STSG website hosted many debates including on transport and inequality and on the purpose of the Aberdeen Western Peripheral Route.

STR 59 covers some of the big topics for 2020 including aspirations to be net-zero on carbon.

Contents

COP 26 3-4

Electric vehicles 5-6

Public Spending and Policy 7-8

Ferry and Air Sustainability 9-10

Regulation on a Spectrum 11

Autonomous Buses 12

Competition and Integration for Bus and Rail 13

Transport Heritage 14-18

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COP 26 Comes to Glasgow

John Yellowlees

Make this the Net Zero COP

The UN's 26th climate change conference in Glasgow on 9-19 November 2020 will bring together over 30,000 delegates from around the world, including climate experts, business leaders and citizens to agree ambitious action to tackle climate change. This will be Scotland's largest-ever such event, so we thought it time to take a look at the former Conservative MP who will not now be its President.

Boris Johnston had designated as president for the conference 55-year-old Claire Perry. One of her contemporaries at Oxford University was Guardian columnist George Monbiot, who described her at the time "a firebrand who wanted to nationalise the banks and overthrow capitalism". In January she was sacked in the role so it seems that a firebrand was not quite what the UK government wanted after all.

Perry gained a reputation for getting things done and as minister with responsibility for rail fares, rail franchising, freight and logistics and transport agencies she resigned in 2016 the day after saying she was "often ashamed to be the Rail Minister". However by 2017 she was back in government as Minister of State for Energy and Clean Growth and built up a strong international relationships wish would have been good preparation for COP26.

Whether or not she would have ended up being "ashamed to be COP26 president" we will never know but her seven point agenda for the event is worth recording here as a benchmark for what she thought was achievable.

1. Ensure every Paris signatory is supported to bring forward an updated Nationally Determined Contribution this year, as they are required to do under the terms of the Paris Agreement.

2. Setting Net Zero as the clear science-based target for all climate ambition from countries, businesses, states and cities and make this the Net Zero COP.

3. Introducing a properly-funded global package for adaptation and resilience building.

4. Placing nature-based solutions at the heart of the climate recovery agenda, with more funding, a new global transparent Nature Exchange for all carbon credits, a new global goal for tree protection and planting and an international rollout of plans for more sustainable supply chains.

5. Embedding in COP26 and future events a strong Clean Growth agenda, including: a financial and strategic package to accelerate coal phase-out; a single global measure of the emissions reduction plans of companies, cities and states; new Net Zero sector deals from some of the hardest to decarbonise sectors and a repurposed Mission Innovation focused on outcomes like scaled up green hydrogen production.

6. Aligning global financial flows with emissions reductions and pricing of physical climate risk, working with private finance, development banks, central banks and regulators.

7. Aiming to close the Paris Rulebook on time this year, while recognising that implementation can begin immediately among countries who have "opted-in" to the rules already agreed and opening the negotiations and COP processes to public scrutiny so the citizens of the world can be our audience.

Troubles at COP 26 are not new for the conference. COP25 had been planned to be held in Brazil in November 2019, but a year before , newly-elected President Jair Bolsonaro withdrew the offer to host the event, citing economic reasons (though later he was to become embroiled in controversy over Amazonia forest-fires).Then Chile stepped up and became the new host, but social unrest associated with a rise in public transport fares forced it late October 2019 to withdraw from hosting. Then by mutual agreement with the UN and Chile, Spain became the new host.

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Various climate activists had set out from Europe to South America by sailboat, before the decision had been taken to relocate COP25 to Madrid, and in mid November, some of these activists joined an alternative conference, the "Forest COP" near the centre of the Amazon jungle.

Climate activist Greta Thunberg had sailed a racing yacht equipped with solar panels and underwater turbines across the Atlantic Ocean in August 2019 to attend climate conferences in New York City and Chile. When the change of venue was announced, she had to make the return voyage on board the catamaran La Vagabonde, departing on 13 November.

News during the Madrid conference in December included:

- Greenland's ice sheet melting seven times faster than in 1990s.
- Oxygen in the oceans is decreasing.
- A quarter of the world's population are at risk of water supply problems as mountain glaciers, snow-packs and alpine lakes are run down by global heating and rising demand.

The results were seen by many as disappointing at a time when climate action and concrete measures are considered urgent Alden Meyer director of strategy and policy for the Union of Concerned Scientists who has attended climate negotiations since 1991 stated that he had never seen before the almost total disconnect between what the science requires and what the climate negotiations are delivering in terms of meaningful action. Greenpeace executive director Jennifer Morgan summarized the prevalent opinion: "Climate blockers like Brazil and Saudi Arabia, enabled by an irresponsibly weak Chilean leadership, peddled carbon deals and steamrolled scientists and civil society

Decisions about the carbon market and emissions cut were delayed to Glasgow, where
USA, Russia, India, China, Brazil, Saudi Arabia will doubtless continue to be the main opponents of such measures. On the other side, the European Union reached an agreement about "The European Green New Deal" that should lower its emissions to zero by 2050. Also, many commitments were made by countries, cities, businesses and international coalitions. For example, the Climate Ambitious Coalition, contains now "73 countries committed to net zero emissions by 2050, as well as a further 1214 actors (regions, cities, businesses, investors) who have pledged the same goal".

"I will continue to do whatever I can to support the best possible outcomes for this COP that has been in gestation for so long that it feels like my fourth child. But I will do so joyfully free from political patronage and pretence, cheering on progress and calling out greenwash, empty promises, dither, and delay "

Claire Perry O'Neill

February 2020

A Public Voice for EV Users

Douglas Robertson's presentation to STSG

Douglas Robertson, President of the Electric Vehicles Association Scotland is a retired electrical engineer with worldwide experience, the last ten years managing ULTra at Heathrow Terminal Five

The Electric Vehicle Association for Scotland (EVAS) has grown from just four guys in 2009 to a present total of 1200 with membership of AVERE, the European Association for Electromobility.

EVAS aimed to be the public voice of users on all issues, urging timely provision of charging infrastructure in order to achieve the Scottish Government's aim of phasing out the need for new petrol or diesel cars by 2032, ahead of the UK's 2040 target. Already SMMT figures show falling sales of diesel cars, down 28% last month on October 2018, and those of Battery Electric Vehicles rapidly rising, up 150% on October 2018. Only the BEV counted as a true electric vehicle, Hybrid Electric Vehicles combining a conventional internal combustion engine system with an electric propulsion system while a Mild Hybrid had a 20hp starter motor and a lorry battery.

Norway was five or six years ahead of Scotland, with EVs now accounting for 50% of sales, and our provision of charging points has improved dramatically in the past 6-7 years with rapid charging now numbering over 350 (2019) due to double in the next 2 years. In Norway they cover the entire ground floor of some multi-storey car-parks with slow chargers which city dwellers can use overnight and still receive almost a full charge. China leads the world with 40% of all EVs sold in 2018.

More than twelve types of BEV are available in the UK, and as more manufacturers entered the market, prices could be expected to fall. The spread of EVs helped address the public appetite for a visible response to climate change, and would also help deliver the Scottish Government's commitment to Low Emission Zones. An amazing 72% of global oil production was still used for of petrol and diesel, and progress in reducing Scottish greenhouse gas emissions had so far been very largely as a result of the cessation of coal-fired power generation, with land transport accounting for a stable 32% of the total, while Scotland exports 28% of its renewably-generated power.

Douglas's personal mission towards going green had progressed from a Nissan Leaf to a Hyundai Ioniq which yielded motoring costs of 35p per mile compared with 49p on a test diesel. His BEVs had given him over 90,000 miles of carefree motoring, and he had fitted solar panels to his home, where he used a Zappi charger which monitored exported power from the property and controlled the charging rate of the EV to match the available surplus generation.

2013 - 2019

Nissan Leaf 24kWh
Acenta 26,500 miles
2013-15

Nissan Leaf 24kWh
Tekna 33,250 miles
2015- to date

Feb. 2015

4kW Solar PV Generated Over 18,400kWh of green energy to date

2017-2020

Hyundai Ioniq 28kWh
30,7 00 miles since Oct. 2017

Change the Mindset of EV Charge Point Planners to make Low Cost Chargers the Norm

Derek Halden

There is a growing body of evidence to show that multiple managed 10A EV charge points offer a much more effective support for EV users than a few 7.5kW chargers. However, it is commonplace to install a small number of higher rated 16A/32A charge points or even a single fast charge point. The research reveals that the mindset of many people planning EV charging is trapped in a "periodic refuel" approach. A new mindset is needed based on a "refuel while parked" approach to ensure that effective charging support is provided for EVs and for the demand for electricity to be distributed as efficiently as possible across the electricity grid.

The mindset of many people planning EV charging is trapped in a "periodic refuel" approach. A new mindset is needed based on a "refuel while parked" approach .

Most cars are parked for over 96% of the time and if charging were available whenever the vehicle is parked, the actual charge current requirement is low. By providing reliable access to low current charging EV users can be confident that wherever they park there will be charge available so that the provision of high current charging is only needed in rare circumstances as a back up when normal charging fails.

Access to chargers should be metered by time not energy to encourage user behaviour that makes the best use of available charging facilities. For most paid car parking in cities the additional costs of offering EV charge points are modest relative to the supply of the parking space so in practice EV charge points can be provided free of charge. Recent research in Oxford shows that the lowest cost charging with plugs on street lighting columns is also the most popular with EV users.

The largest element of the cost of EV chargers is the capital cost of providing the charging unit and the electricity metering and payment functions. By minimising the capital costs through the use of lighting columns, and eliminating the requirement for metering and payment, the successful trials in Oxford have also shown that EV charging and fit seamlessly into the streetscape and be highly cost effective. Even where lighting columns are not available low cost 10A charging units can be installed for an average of about £250 compared with nearly ten times this cost on average for faster chargers.

Motivating people to transition to EVs from petrol and diesel cars requires far better availability of EV charging than is currently available. The recent research shows that with a growing number of ultra-low carbon vehicles on the road EV charger availability is now far lower than it was 5 years ago. If EV charging point planners such as local authorities, car park operators, employers with workplace car parks, supermarkets, leisure attractions and others can break out of the "periodic refuel" mindset the future for EV take up will become much more attractive.

High cost rapid chargers as a back up when other systems fail or in special locations

Scottish Government Transport Spending is not yet Aligned with its Policy

Briefing papers by Alan Rehfisch for SPiCE the Scottish Parliament identifies that after 20 Years of the Scottish Parliament transport trends are still running in the opposite direction from that intended by policy. There is also little sign that government plans to change this in the immediate years ahead based on current spending plans

A clear and detailed briefing in December 2019 by Alan Rehfisch at SPiCE the Scottish Parliament Information centre concludes that since the creation of the Scottish Parliament, more people have chosen to drive more often – partly at the expense of trips previously made on foot or by bus. This is generally counter to the thrust of Scottish transport policy, which aims to encourage people to switch from the car to walking, cycling or public transport – particularly for shorter trips, bringing environmental, health and economic benefits.

There appears to be a clear correlation between the Scottish Government investing significant sums in trunk road and rail infrastructure and growth in their use and the investment of far smaller sums in buses, walking and cycling and their decline or stagnation. The Government spending shadows consumer spending where car purchase and fuel is the largest component of household spending on transport. Indeed, the contribution made by Government towards road transport is a relatively small proportion of the total investment in road transport, which begs the question why Government spends so much public money following the market rather than addressing market failure. Relatively small changes in costs for road users could wipe out the need for government spending, so that public funds could be used to deliver very large impacts on its policy priorities for active travel and public transport.

As auditors frequently point out, if you do not measure what you value you will end up valuing what you measure. This seems to be the case with transport statistics where SPiCE note that in contrast to car travel and demand which attracts the greatest attention in National Statistics, for walking "trends since 1999 cannot be identified". However, there is enough evidence to demonstrate that despite walking still being one of the most popular modes of travel the proportion of trips made on foot has been falling.

SPiCE comment that these trends pose a major challenge for the next 20 years, during which the Scottish Government has committed to the almost complete decarbonisation of transport in Scotland. While the National Transport Strategy focuses policy on sustainable and active travel, the Scottish Government 2020 budget has confirmed the investment of £6bn in the dualling of the A9 between Perth and Inverness and the A96 between Inverness and Aberdeen. In addition to significant emissions during construction, the new investment could lock in higher emission travel choices for years to come. Transport Scotland themselves predict a 27% increase in the distance driven by car between 2015 and 2035.

There appears to be a clear correlation between the Scottish Government investing significant sums in trunk road and rail infrastructure and growth in their use and the investment of far smaller sums in buses, walking and cycling and their decline or stagnation

The SPiCE briefing summarises the key changes since 1999 as follows:

- Scotland's roads are safer with the number of people killed in road traffic collisions falling by 53%, from 310 in 1999 to 146 in 2017. The number of people seriously injured in road traffic collisions fell by 58%, from 3765 in 1999 to 1589 in 2017.
- Scotland's roads are more crowded with the number of motor vehicles registered in Scotland increasing by 39%, from 2.131m in 1999 to 2.962m in 2017. The distance travelled by motor

vehicles in Scotland increased by 20%, from 39.8 billion km in 1999 to 47.9 billion km in 2017.

- Bus patronage is down with the number of local bus passengers fell by 14.7%, from 455m in 1999-2000 to 388m in 2017-18.
- Rail patronage is up with the number of ScotRail passengers increased by 58%, rising from 61.72m in 1999-2000 to 97.78m in 2017-18.
- Travel by bike, as a proportion of total distance travelled, is effectively unchanged: Total distance cycled has increased by 22%, rising from 238m kilometres in 1999 to 290m kilometres in 2017. However, given the increase in total distance travelled by all modes, travel by bike accounts for the same proportion of total distance travelled in 2017 as it did in 1999 (0.6%).
- The proportion of trips made on foot is down but changes in the way walking statistics are collected mean that trends since 1999 cannot be identified. From the available statistics it is observed that the proportion of trips longer than 0.25 miles (or five minutes) made on foot fell from 19.5% in 1999 to 13.6% in 2006. The proportion of all trips that are made on foot has been on a further downward trend since 2012.
- The environmental impact of transport has grown in significance with transport greenhouse gas emissions (excluding international aviation and shipping) falling by only 11%, from 14.2 MtCO2e in 1999 to 12.6 MtCO2e in 2016 compared with total Scottish greenhouse gas emissions which fell by 46% during that period. Transport is now the largest source of Scottish greenhouse gas emissions. Also transport emissions stopped falling in 2013 and have increased annually since then.

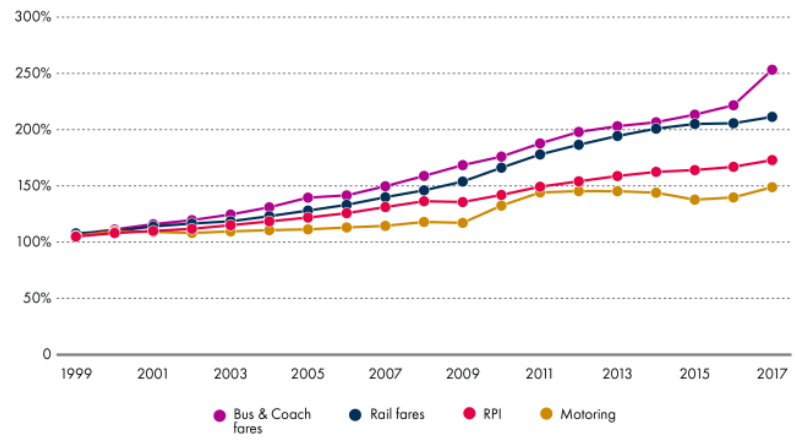
SPiCE comment that increasing uptake of ultra-low emission vehicles could mean that increasing vehicle mileage is not such a major concern. However, the growth in the distance driven has negated the positive impact of improvements in fuel efficiency and emissions from newer vehicles since 1999, and Scotland has yet to identify a strategy to make ultra-low emission vehicles more mainstream despite some neighbouring countries like Norway having transformed their car market over the same period. Ultra-low emissions vehicles accounted for only 2.2% of all new vehicle registrations during 2018, and that the average lifespan of a car is 13.9 years. Large changes in the environmental performance of the Scottish vehicle fleet seem to be many years off.

SPiCE highlights the importance of making significant investment in measures proven to encourage people to switch from driving to walking, cycling and public transport. Currently policies appear to be managing car travel demand upwards whilst policy seeks the opposite outcome.

The briefing papers can be found here https://spice-spotlight.scot/2019/12/04/you-get-what-you-pay-for-20-years-of-devolved-transport-policy/ and https://spice-spotlight.scot/2020/02/11/transport-a-climate-emergency-budget/

The proportion of trips made on foot is down but changes in the way walking statistics are collected mean that trends since 1999 cannot be identified

UK retail prices index: Transport from 1999



Optimised Sustainable Combinations of Air and Sea Travel to Remote Island Communities

STSG sponsored Strathclyde University Student Thomas Schoenberg to look at the relative environmental performance of air and sea transport for providing more frequent services to Scottish Islands. The work found that investment in air services could often be more sustainable enabling more efficient travel patterns than could ever be achieved with more frequent ferries

Remote islands need good transport links to support their populations, economies and communities and to provide access to services. Challenges to delivery arise from people's rising expectations, changing economic and political circumstances, seasonal variations and from the need to coordinate with mainland transport.

The research looked in detail at three small Inner Hebridean islands of Tiree (population 653), Coll (195) and Colonsay (124) all rely for employment on public services, tourism and farming, with Coll also having crofting and Colonsay a brewery.

Coll and Tiree share a daily sailing from Oban that is Wednesdays Excepted in winter. The ferry to Colonsay runs from Oban or Kennacraig, and is Tuesdays, Thursdays and Sundays Excepted in winter. Passenger numbers are three times as high in summer as in winter to Coll and Tiree, and four times as high to Colonsay.

Out-and-back air services to Coll and Tiree and to Colonsay using an 8-seater Islander aircraft started from Oban Airport in 2008 with support from Argyll and Bute Council, and at the time of Thomas's study ran twice-weekly plus weekend flights for scholars. With occupancy at 40%, better marketing could loadings, and there is a desire for greater frequency offering a day-trip opportunity from the islands and scope to spend long weekends there.

These small aircraft are much more environmentally friendly that the comparatively big ships such as the Lord of Isles, generating 0.215 tonnes of carbon dioxide per head as compared with the latter's 1.953. The sea crossing has to be very full to come into its own environmentally, but of course the ship is the only way of conveying vehicles. At the island end of the journey, since the demise of postbuses a car or bicycle may be needed by air travellers as the airfields are remote from the villages.

A stopover on the islands could be optimised by offering more frequent flight or ferry options with longer turnarounds. The ships now used no longer provide overnight accommodation for either passengers or crew. Its smaller environmental impact makes air more attractive for supporting additional journeys, but account has also to be take of the different impacts of bad weather.

The North Atlantic Oscillation causes weather variability by shifting the jetstream. For ferries it is the January waves and gales that are most likely to force cancellation of sailings. Aircraft may not be able to cope with ice and snow on the runway, with crosswinds and with poor visibility in fog. Air disruption is greater and over a longer period of the year than sea, though there is anecdotal evidence that captains may be becoming more risk-averse than in the past.

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Emerging technologies could provide drones for freight transport, offering greater resilience and even less carbon dioxide emission than aircraft, and Vertical Take Off and Landing craft for passengers providing more demand-responsiveness and possible reliance on locally-generated energy.

Any proposals for change have to be sifted through an analytical triangle of accessibility, economic appraisal and affordability. Since the completion of the study, in the absence of a Public Service Obligation Argyll and

Bute Council was obliged by the £280 per head subsidy to reduce its support from twice-weekly to just one flight a week, and one might ask why are such lifeline air services subject to much less attention by central government than that given to ferry reviews. The ongoing application of Road Equivalent Tariffs cutting fares for passengers accompanied by vehicles has continued the upsurge in people taking cars, which could be a threat to the viability of connecting public transport - on some Hebridean routes customers have to book their cars up to a fortnight in advance. Across the Highlands the infrastructure is struggling to cope with an upsurge in tourist numbers prompted by favourable exchange rates, the comparatively low cost of motoring and greater awareness arising from such phenomena as North Coast 500 and Outlander, with a folk festival on Tiree being one local manifestation.

The impact of health changes is significant, for the public sector is the main user of flights as nurses and doctors fit day visit into their schedules (so the Council is in effect subsidising NHS Highland) while centralisation of healthcare provision may be obliging islanders to make more and longer visit to the mainland - but delivery of drugs could lead the way on use of drones. With only Tiree having a secondary school, scholars form the backbone of demand for flights from the islands, but could face-to-face teaching be supplemented by virtual classrooms?

Notwithstanding the current controversy over ship procurement, could be a more economical type of vessel be deployed, and would there be scope for short-sea crossings from the nearest landfall rather than the present geography of ferry routes?

An electric Islander is reportedly going to be tested in Orkney, and perhaps the islands could form a useful testbed for the trialling of hydrogen vehicles to improve their internal connectivity. Notwithstanding the current controversy over ship procurement, could be a more economical type of vessel be deployed, and would there be scope for short-sea crossings from the nearest landfall rather than the present geography of ferry routes?

Regulation on a spectrum – from tick boxing to audacity

Former Traffic Commissioner Joan Aitken's presentation to STSG

Speaking to the theme of "Regulation on a spectrum – from tick boxing to audacity" our guest speaker Joan Aitken OBE told us that she had served from 2003 until her recent retirement as Traffic Commissioner for Scotland, succeeding Michael Betts a military man who had done a lot to drive up professional standards. She inherited a Traffic Area Office in which civil servants conscientiously did the day job of keeping the paperwork flowing but when left to themselves would default to a turgid bureaucratic approach. She was seized of the independence of her role as defined in statute over 85 years, and determined to lead by example so as to provide a dynamic engagement with the road haulage and passenger transport industries in the cause of keeping Scotland safe.

Joan was soon to encounter sexism, being discriminated against in her own office and perceived outside it as "the little woman". Her previous experience as Scottish Prisons Complaints Commissioner gave her an insight which won her staff's respect when she correctly anticipated that a bus driver sacked for stealing clothes from a washing-line had actually taken ladies' lingerie. She liked to go out and about, and turned up in person at a meeting of operators to resolve bus wars in Barrhead.

Complacency could be the enemy of safety, and regulatory capture when too close to the detail could let the side down. Thus a boast of 80% compliance was really an admission that 1 in 5 vehicles was failing : if the patch was dire, then above-average performance might still be not nearly good enough. In seeking to further professionalise the industries Joan as the lay person learned to champion nothing less than 100% pass rates, and in her insistence against chumminess believed that behind every action plan there should be a harm that we were trying to prevent. Fashions in regulation could be dangerous if the process itself became invisible and separate from service-delivery, but light-touch regulation might tend towards no regulation at all. As the gatekeeper seeking to keep people safe, Joan developed an intuition from her reading of the weekly Notices & Proceedings that enabled her to tell when something was not quite right. She wanted to be sure that people

If the patch was dire, then above-average performance might still be not nearly good enough.....a boast of 80% compliance was really an admission that 1 in 5 vehicles was failing

were doing what they said they would do, in the knowledge that those she stopped would probably try the same thing again in a different guise, and got her staff onto the chase, gatekeeping to keep the bad people out while respecting people's livelihoods and ensuring awareness of what the Traffic Commissioner did - she had to fight to get a press officer, but the result was worth it.

Joan's campaign against complacency extended to timekeeping, and as the "little lady at the bus stop" she made it clear to operators that while illness, accidents or flooding were reasonable explanations she was not going to accept excuses like new rotas or drivers off the road for disciplinaries as causes of tolerance for services not achieving all departures within 5 minutes of schedule. By way of example a working breakfast with First Glasgow allowed her to press home her concern that last buses should not leave the city centre before their booked time since as she told them the industry was responsible for the well-being of the city.

Her work brought about awareness of the transport and logistics sector's opportunity to do worldwide good by means of the charity Transaid's work towards transforming lives through safe, available and sustainable transport which had taken her on sponsored cycle challenges in South Africa and Zambia.

Go Forth and Automate!

Starting later in 2020, Project CAVForth will be Europe's first full-size self-driving bus service, negotiating junctions, bus stops and other road-users automatically but with a driver on board for safety reasons.

Part-funded by the Scottish Government's Centre for Connected and Autonomous Vehicles fund, it will see five single-deck Enviro200 Stagecoach buses built by Alexander Dennis operate a 14-mile route linking Ferry Toll with Edinburgh Park, running via the M90 and the Forth Road Bridge and carrying up to ten thousand passengers a week.

Cabinet secretary for transport Michael Matheson pictured below at the launch of the vehicles in November said "Our trunk road network can provide a wide range of environments as a diverse testing ground, and the ground-breaking and globally significant Project CAVForth will really help Scotland establish its credentials on the world stage."

Led by UK technology company Fusion Processing Ltd, the £6.1M project has involved the public and private sectors throughout its development, and puts Scotland at the forefront of the new driverless technology in accordance with the Scottish Government's CAV Roadmap. Edinburgh Napier University will be measuring the wider society viewpoint and Bristol Robotics Laboratory will provide vehicle simulation, validation, safety and compliance.

Jim Hutchison of Fusion Processing says that as well as providing autonomous systems, they will develop spinoff projects from the technology that can help today's manual driven buses, such as technology that can recognise pedestrians and cyclists and warn the driver, automated emergency braking and replacement of external mirrors with advanced vision systems."

Martin Griffiths

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Stagecoach CEO believes that the bus industry, customers and employees can benefit hugely from autonomous technology as it can make services safer, more efficient and help to deliver better journeys.

Colin Robertson, Alexander Dennis Chief Executive, says that the trial allows them to evaluate potential benefits of autonomous technology under real operating conditions, and feeds into their extensive work to further improve the safety of buses with the help of state-of-the-art technology

New trains being built by Stadler for the Glasgow Subway will also be driverless, and are expected to enter service next year.

Competition and Integration in Bus and Rail Systems

Derek Halden and John Yellowlees

In the rhetoric of transport planners, bus and rail face greater competition from car than they do from each other. Could bus and rail present a more competitive offer for customers through more integrated door to door journey solutions?

Bus and rail largely serve different markets, but there can be rich pickings for a rail operator that takes demand from busy bus services and for bus operators that compete, usually on price with established rail markets. For example, Lothian Country Buses new EX1 and EX2 routes from West Lothian to Edinburgh are also served by busy rail services.

Discussions about integration usually concentrate on operational issues such as joint planning of timetables and the availability of tickets that a customer can use for the combined bus and rail journey. Rail operators such as ScotRail get regular requests to provide more joint tickets. However, when these joint offers are made available, they are not particularly popular with customers. Integration of routes appears similarly fragile. Lothian Buses were reluctant to reroute bus services into the new Edinburgh Gateway Station to help support rail growth in that corridor and McGills for a time did not stop at the newly-improved Lenzie Station. Several ScotRail stations have disused bus shelters, such as Newcraighall, Barrhill and Keith. There seems to be a gap between what customers say they want and the delivery realities.

The lack of integrated business models has long been seen as a problem. This summer the DfT published their long awaited review of their 'total transport' initiative, which had supported the development of more integrated business models. The review identified a few small successes in niche markets. Similarly, despite big claims for potential "mobility as a service" (MaaS) business models, after years of substantial funding the practical delivery amounts to a few niche projects. Investors in MaaS will demand mass markets to get their money back, but it is far from clear that these financial goals will ever be consistent with support for increased public transport use and reduced transport pollution.

The costs of organising integrated solutions have often exceeded the extra revenue from additional passengers. The reason we have so little integration is that integration 'within the transport sector' is usually less profitable than competition. In contrast, the integration that has been both financially viable and attractive to customers has been integration between transport and other parts of the economy, particularly the retail and service sectors, such as the golf link services from stations and shopper bus services to connect retail destinations. There is rapid growth in the aggregation of services allowing transport, hospitality and retail sectors to grow together, particularly by technology transport operators such as Uber. These approaches share benefits through commission for partners, delivering more attractive and profitable offers to customers.

However, bus and rail operators tend to operate on business models that make sharing commission much harder than for taxis, coaches, hire cars and other transport. With current technology systems, travel agents and journey planners can now plug systems together to offer customers seamless travel options to their destinations. Against this bus and rail information and ticketing looks very closed. Openness and joint working is still so rare it is newsworthy, such as the information screens in St Andrews Bus Depot which show train departures from Leuchars, and the new screens at Oban rail station which show departures by rail, bus, sea and also flights from Oban Airport.

The future of rail is secured by its fixity in the built environment and unique ability to move large volumes of people quickly between city centres. Car is not a particularly strong competitor with many rail markets. In contrast, bus travel offers a far greater level of flexibility, and if well planned has the potential to match many more car journeys on cost, convenience and speed. Unfortunately, current bus operations are not designed to compete with car travel, with too many stops and uncompetitive journey times. Car and rail currently seem to be delivering in their potential markets much better than bus, which instead relies on diminishing returns in declining markets.

The balance between competition and integration has long been viewed as one of the difficult choices a bus operator needs to make. This is changing. The companies achieving optimal integration are also becoming the most competitive. The winners in the future of public transport will be those who manage their value chain through integrated delivery models.

Railway Development and the Scottish New Towns

John Yellowlees

You might think that the Scottish new towns developed in the idealistic years after 1945 would showcase excellence in public transport provision. However their connectivity with the rail network suggests otherwise.

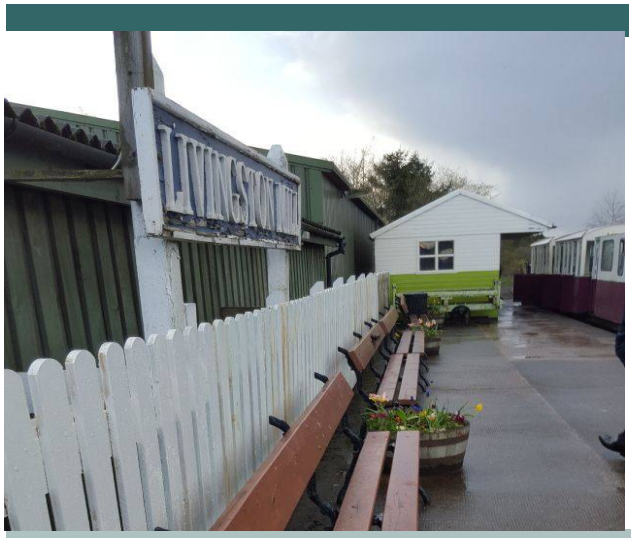
As post-war austerity and rationing gave way to the "you've never had it so good" years, the car would become king, with families enjoying new-found freedom and politicians reluctant to kick the ladder of upward mobility. New towns projected an image of new opportunities, which if their economies were to be self-contained would preclude a need for mass commuting in or out of them. The eras of road congestion and of economic globalisation were as yet in the future!

Memorial bench at East Kilbride Station

East Kilbride's branch line terminus was in the old village, which soon became off-centre as a landscape developed of roundabouts and new neighbourhoods. It took a vigorous campaign by the East Kilbride Development Association led by Jack and Helen Broadbent to see off closure in the Beeching years, and a much-discussed extension to the new Town Centre never happened. With the switch to online shopping that is perhaps now less important, and with buoyant ridership the line is at last awaiting electrification.

Glenrothes was placed astride the A92, and any usefulness of a freight branch was neglected. Markinch on the Edinburgh-Aberdeen main line made an uncertain claim to be the station for Glenrothes until it was rebuilt in 2007 to become a transport interchange with bus and rail real-time information. But the name had unfortunately been ceded to a new station at Thornton on the Fife Circle three miles outwith the new town that

Sounds like a whisky-flavoured chocolate - unfortunately not in Glenrothes



This heritage railway station at Livingston is as near to the town centre as its two mainline ones

opened in 1992 with part-funding from the Development Corporation - hence the misleading Glenrothes with Thornton.

Livingston bestrode a north-south highway from nowhere to nowhere, the station for the village of that name having closed in 1948 eight years before the withdrawal of passenger services along the Edinburgh-Airdrie-Glasgow line on which it stood - just as the new town was being designated to take Glasgow overspill, and four years before Airdrie-Glasgow went electric! As the new town extended to the Shotts line, it gained a station at Livingston South in 1984, and eighteen months later Livingston North appeared on the reopened Edinburgh-Bathgate line which with electrification a generation later reached out again to Airdrie and Glasgow - as far-sighted planning would have demanded in the first place. However both stations remain remote from the town centre, and in the absence of a footbridge the platforms at Livingston North are quite remote from each other!

Shiny new station at Cumbernauld provided with electrification

Cumbernauld was the only second-generation new town - and is also the only settlement anywhere along the watershed that divides the rivers of Scotland from the Borders to Caithness. When the main line closed in 1966, the station serving the old village was retained by provision of a diesel shuttle to Springburn. Nearby at Croy the station on the main Edinburgh & Glasgow Railway was put up for closure but wisely reprieved, and is today Scotland's largest rail park-and-ride : while in the last years of the twentieth century the Cumbernauld-Springburn shuttle grew into a direct Glasgow-Falkirk

Diesel and steam at Tweedbank in the new line's first week

Grahamston service that today is a sixth electrified route between Scotland's two main cities, with a Cumbernauld-Motherwell shuttle that started in 1996 now providing an alternative electrified route via Hamilton to Glasgow and beyond. However easy access to the motorway ensures that rail has to contend with intense bus competition.

Though Tweedbank was not an official new town, it was promoted in that spirit on the recommendation of the Central Borders Plan published in 1968 which was silent on the future of the threatened Waverley Line. There being no joined-up thinking between the Scottish Development Department and the Ministry of Transport, the Line closed in January 1969, and it took 45 years and £350M for the new Borders railway to reach its Tweedbank terminus.

Blue skies at Irvine

Finally at Irvine lessons were seen to have been learned, for the town centre is close by a station on the main Glasgow-Ayr line which has since been electrified with nowadays four trains an hour in each direction. But by the late 1960s the glory days of the Scottish new towns were passing, and one at Stonehouse proposed soon after the line through there had closed was cancelled - so we shall never know whether its reopening as far as Larkhall in 2005 might have extended further.

End of the reopened line at Larkhall - for Stonehouse was end of the line for new towns

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Transport Trust Red Wheels Programme

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The Transport Trust is the only national charity established to promote and encourage the preservation and restoration of Britain's unique transport heritage in all its forms - road, rail, wings and water. The Trust's Transport Heritage programme commemorates Britain's rich and globally important legacy in the development of transport. The aim is to present a comprehensive overview for each site, in a way that will attract a new and wider audience.

The Red Wheel Scheme was created by the Transport Trust to recognise and commemorate the most significant sites of historical importance to transport heritage in the United Kingdom by erecting a Transport Trust Heritage Plaque or "Red Wheel" on the physical site. This is backed up by extensive search functions within our website to locate sites of greatest significance. The Trust have placed 120 Red Wheels around the UK over the last 10 years, and are keen to maintain the high quality of sites that they identify.

The aim is to highlight locations of historical significance, preferably to more than one mode of transport, that are both worth seeing and worth going to see, are perhaps in need of being better known and when viewed together as a virtual tour might encourage consideration of a career in transport.

Scotland was lagging behind until the unveiling of the first Red Wheel north of the Border by Transport Scotland's Bill Reeve in August 2019 at Paisley Canal, a location that weaves a rich thread of history : a Telford canal with the longest arch but also scene of the worst disaster of

The Red Wheel at Glenfinnan

the canal age that turned into a railway that then closed but was partially reopened - the rest becoming a cycle-path - and then electrified.

Two days later, the Trust's President Lady McAlpine was at Glenfinnan to unveil the second one hailing the mighty Viaduct that pioneered mass concrete but is now synonymous with Harry Potter. Then in November a Past President of the Institution of Civil Engineers Professor Gordon Masterton did the honours at Wemyss Bay, where the Wheel marks James Miller's design of what is often regarded as Britain's most beautiful station but is also a marvel of efficient interchange between rail and sea.

Next up will be the 1722 Waggonway at Cockenzie, Scotland's first railway over which the Battle of Prestonpans was fought in 1745. Other locations in preparation include the Churchill Barriers completed in 1945 which as well as reinforcing the defences of Scapa Flow created a road link between the Orkney mainland and the southern isles of Burray and South Ronaldsay. Granton in Edinburgh was the southern terminus of the world's first train-ferry, while the Union Chain Bridge across the River Tweed was the first suspension bridge in the world to carry vehicles.

The first Red Wheel in Scotland being unveiled by Transport Scotland's Bill Reeve in August 2019 at Paisley Canal with Renfrewshire Provost Lorraine Cameron and the Transport Trust's Jerry Swift