



Scottish Association for Public Transport

SCOTTISH TRANSPORT MATTERS

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COP26 was an opportunity to show off electric public transport. Cars were not admitted (except for the US President!)

First Glasgow operated a shuttle for delegates from central Glasgow hotels to the Scottish Events Campus using battery-powered buses (seen left at Nelson Mandela Place).

ScotRail estimate that around 107,000 passengers used electric trains through Exhibition Centre station during the two week event.

Change of SAPT Postal Address

SAPT postal mail has for many years been handled by the Glasgow Council for Voluntary Service. Due to sale of their Queen Crescent premises, our postal mail will now be routed through their Albany training centre, address as follows: **SAPT, c/o GCVS, 44 Ashley Street, Glasgow G3 6DS**
Our email address remains unchanged.

Scottish Association for Public Transport, c/o GCVS, 44 Ashley St, Glasgow G3 6DS
 Email: sapt@btinternet.com web: www.sapt.org.uk Mobile: 07760 381 729

COP26 was held in Glasgow from October 31st 2021 for two weeks. Participants were given a free travel pass for any bus, tram, subway or ScotRail train from 25th October to 13th November. Several local organisations pointed out that no such multi-modal travel card (free or otherwise) is available for Scottish residents!

The COP26 Transport day was not entirely successful, with four of the world's largest carmakers failing to sign the pledge to sell only zero emission cars and vans by 2035. Volkswagen, Toyota, Renault-Nissan and Hyundai-Kia did not sign. But Ford, General Motors and Jaguar Land Rover did sign up. It remains to be seen how this fits with the Scottish and UK Government commitments to ban the sale of all new petrol and diesel cars and vans from 2030.

Public transport operators made a better show during COP26 with electric buses and zero emission trains.

A Hydroflex **hydrogen/electric** train (a Class319 electric multiple unit converted by train leasing company Porterbrook) gave demonstration runs round the Cathcart Circle during COP26. To allow hydrogen tanks and fuel cells to be viewed by delegates on the trip, the tanks were empty and the train used 25kV/AC power. The hydrogen tanks and fuel cells give a range of 600 miles on hydrogen. The tanks fully occupy one coach of the four-coach train, which could be a consideration on single-track lines where overall train length is limited by the length of passing loops.



Hydroflex hydrogen/electric train (above) and VivaRail battery train in Glasow Central. Photos: J.McCormick



The Vivarail battery-electric train gave demonstration runs from Glasgow Central to Barrhead and back during the COP26 fortnight. The interior of the three-coach unit had a high quality of comfort and finish. The unit had fast acceleration. Vivarail staff explained that the train is highly configurable in terms of seating layout and door positions. Fast charge technology means train batteries can be recharged in 10 minutes at a charging station. Battery range is 80 miles.

However, the unit's history as a London Underground Train was obvious from the ride quality over junctions, making this train unsuitable for main lines or long journeys.

Producing the energy to power the switch from hydrocarbons is a challenge that still has to be solved. Power prices have already surged to record levels. The last Scottish nuclear power station at Torness is due to close in 2030, just as sales of diesel and petrol cars are due to cease.

The recent fuel shortages may be a precursor of the shape of things to come. Panic at the petrol stations will become chaos at the chargers. This will be a huge opportunity for rail travel.

The SAPT AGM was held on 17th September 2021 by Zoom. Bill Reeve, Transport Scotland Rail Director, was the guest speaker, giving a talk on the Scottish rail situation and rail decarbonisation programme.

ScotRail patronage has recovered to around 50% of pre-covid levels. Leisure travel is growing faster, with Saturdays now up to 80% of the former level. Scottish government support for rail, previously around £1 billion annually, has now grown with emergency support to £1.5 billion. Rail needs to become more competitive and efficient. There is no point in running trains for journeys no longer needed. Peak-hour commuter trains are expensive on capacity and costs. Tourism and long-distance travel by rail now have better growth prospects. The Jacobite shows how a well-marketed tourist service can sell out despite charging three times more for tickets than ScotRail. First class on the Jacobite sells out fastest yet costs five times more than ScotRail tickets!

Transport generated 14.9 million tonnes of CO₂ which is 37% of the total in Scotland. Shares were as follow:

Cars	40%
Aviation	15%
Shipping	15%
Road haulage	12.5%
Vans	12.5%
Buses	3.2%
Rail	1.2%
Other	0.5%

ScotRail should be fully decarbonised by 2035. 76% of passenger journeys are already made on electric trains. Electrification will be phased with life expiry of rolling stock:

- 2025 Class 156 diesels
Class 318, 320, 334 electrics
(electrics may be re-engineered)
- 2030 Class 158 diesels
Inter7City HSTs
- 2035 Class 170 Turbostar diesels



Transport Scotland has a rolling programme of electrification. Overhead gantries are already erected at Crossmyloof (above) on the electrification scheme to Barrhead and East Kilbride as a smoky 4-car Class 156 leaves for East Kilbride on 9/11/21.

Photo J.McCormick

Plans are being prepared for electrification of lines from Edinburgh to Fife and Tweedbank. Hopefully these lines can be fully electrified so no heavy batteries will be needed in trains.

The target electrification cost of £1M per single track kilometre is still high. But overall project costs can include resignalling, platform upgrades etc. A rolling programme of electrification is essential for learning how to reduce costs, which are already lower in Scotland than elsewhere in the UK.

The major contribution of rail to cutting emissions is however to attract modal shift from other modes.

Freight has returned to pre-covid levels and is now growing further. There are around 40 freight trains operating daily into and within Scotland. Only 45% of these are electrically hauled. The trouble is that links to many English freight destinations are not electrified, for instance Felixtowe. Diesel haulage not only produces higher emissions but also affects performance: the Tesco freight train slows to just 18mph on steep climbs on the Highland Main Line.

Objectives for the future are a lower net cost railway, improved reliability and shorter journey times.

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Powering Future Rail Transport

Professor David Murray-Smith, Emeritus Professor of Electrical Engineering at Glasgow University and SAPT Vice-chair, updated the AGM on future power technology for trains in Scotland.

Action to reduce emissions is stepping up across all transport modes. Hydrogen buses are now running in Aberdeen. First Glasgow conveyed COP26 delegates to the conference in battery buses. Some ferries in Norway use batteries, and CalMac operate 3 short distance hybrid ferries.

Current average CO₂ emissions for different modes, estimated by the European Environmental Agency, show the wide variation between rail, road and air transport:

	Rail	Road	Air
gCO ₂ per passenger kilometre	28.4	101.6	244.1
gCO ₂ per tonne-km	15.6	139.8	up to 820

Fundamental issues affect fossil fuel alternatives. Hydrogen takes 8 times more space than the equivalent diesel fuel. Battery packs take 16 times more space and introduce extra weight.

Rail electrification is the most efficient use of power. Typical comparison for rail shows this.
1 kW electricity from the grid produces

- 0.83 kW at the wheels for an electric train
- 0.72 kW for a battery train
- only 0.29 kW for a hydrogen train.

Efficiency is lost through transmission, charging, electrolysis and the fuel cell process.

The target capital cost of overhead rail electrification is £1 million per single track kilometre, though most schemes cost substantially more than this. But the capital cost of electric trains is lower than for battery or hydrogen trains. Conversion from existing emus or dmus is an attractive option for train leasing companies. Running costs for new hydrogen trains are estimated to be almost twice the cost for electric trains. Battery train running costs are about 25% higher.

A summary of rail decarbonisation options:

- Rail can reduce greenhouse gas emissions by taking traffic from road and air, as well as reducing its own emissions
- The main emphasis should be on conventional electrification
- Batteries are useful for short routes and a transitional stage for discontinuous electrification
- Battery/hybrids are an option for longer rural routes. Trains could be new build or conversions of existing trains. Hilly routes need large batteries but this involves extra weight. Space is needed for hydrogen storage tanks which, in the UK loading gauge, will reduce passenger accommodation.
- There is still no alternative to diesel for freight and sleeper services on unelectrified lines.

Many uncertainties remain. Research is being carried out worldwide. The next section focuses on work being carried out in Scotland.

The second section of David's talk consisted of a progress report on the industry and university collaboration to develop a trial hydrogen train in Scotland. Early in 2020, Transport Scotland and Scottish Enterprise announced financial support for development of a hydrogen fuel-cell/battery-electric multiple-unit for trials in Scotland (on important secondary routes, such as the West Highland Line, where the business case for electrification is unlikely to be strong).

A contract for converting a former ScotRail Class 314 three-coach electric multiple unit (photo on right) to a hybrid configuration has been awarded to a group of companies led by Arcola Energy Ltd.

Hydrogen fuel-cell stacks have a sluggish response to demand for power level changes. Their efficiency depends on the operating condition. Powertrain control strategy may therefore involve fuel-cell operation with slow rates of change, with fast dynamic changes and peak loads being supplied by the battery pack.



*A Class 314 is being converted to hydrogen fuel cell power (reclassified Class 614) at the Bo'ness and Kinneil railway workshops by a consortium led by Arcola.
Photo: David Murray-Smith*

The battery pack recharges through regenerative braking or from available power from the fuel-cell stack. Optimal powertrain configuration depends on route characteristics. Relatively flat routes and operation at constant speeds favour large fuel cells. Routes with prolonged and steep gradients or needing high acceleration require larger batteries. Specification for long routes with steep and prolonged gradients, such as in the Scottish Highlands, present significant difficulties.

Train performance can be simulated mathematically using power or tractive force variables as input, and acceleration, speed and distance travelled as outputs. This allows assessment of hydrogen train design for specific routes, and also for test routes with simplified gradient profiles typical on routes of interest. These simplified test routes provide useful insight into the effect of train characteristics on the specification for fuel cell stacks, battery packs and other powertrain components.

These simulation methods enable investigation of performance sensitivities, not only in terms of longitudinal train dynamics but also the powertrain parameters and route characteristics. The impacts of trade-offs made to reduce weight and volume of powertrain components and the cost of the train can be modelled.

Fuel-cell efficiency can also be considered, as larger cells allow performance over a wider range of conditions. Findings from test routes give an idea of powertrain ratings and storage requirements to operate a 3 coach hybrid fuel-cell/ battery electric train on the Glasgow to Fort William line.

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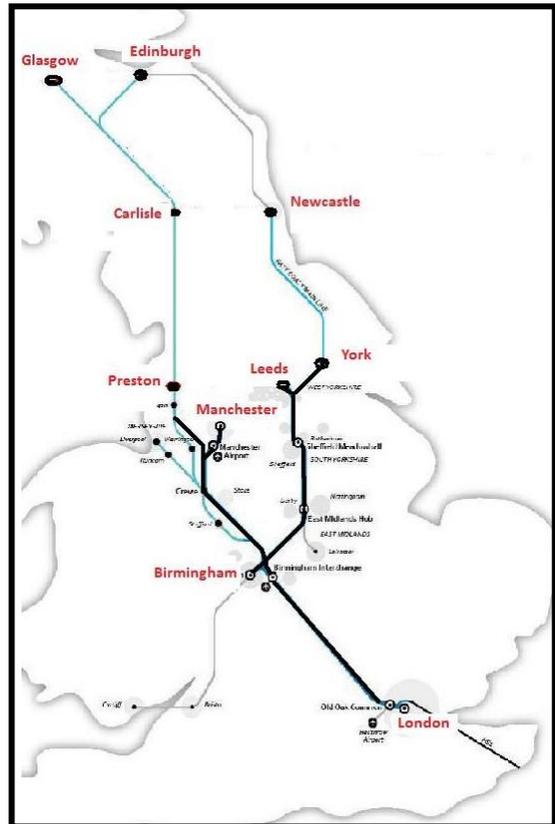
HS2 and Integrated Rail Plan

The UK Government published its Integrated Rail Plan for the North (of England) and Midlands on 18th November 2021. Although it is not primarily concerned with Scotland, there are significant implications for us. The most controversial aspect of the plan is the curtailing of the eastern leg of the “Y” from Birmingham to Leeds and York (see right).

This rules out the possibility of London-Edinburgh HS2 trains running via Birmingham and York. Instead, the existing East Coast Main Line is to be upgraded to 140 mph in places, cutting journeys from London Kings X to Edinburgh from 4 hours to 3 hours 35 minutes using the current Azuma trains.

The London-Crewe-Manchester HS2 route is continuing to be built as planned. But the link to the West Coast Main Line (WCML) at Golbourn (south of Wigan) is no longer going ahead: an alternative better option would be to extend HS2 further north to join the WCML south of Preston.

The UK government’s Union Connectivity Review is examining rail links to Scotland. SAPT will update our recommendations to this review in the light of the Integrated Rail Plan, and the growing need to create capacity for more freight trains.



Above: Original “Y” route proposed by HS2.

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Transport News

Collated by John McCormick with contributions from John Yellowlees and John Wilson

S Scotsman *EN Evening News* *T Times*

Aviation

Easyjet has plunged to its second consecutive year of billion-plus losses. It expects to report an annual loss of £1.17 billion in its financial year to September 2021. Chief Executive Johan Lundgreen says it is too early to say if it will be back to normal by summer 2022 (T).

The owner of British Airways will plunge to losses of 3 billion euros this year, despite getting its flying schedule back up to more than half the pre-pandemic level (T).

Loganair has announced direct flights from Edinburgh to Londonderry starting in May 2022 (S).

Lib-dem MSP Alex Cole-Hamilton has called for the Scottish Government to cease support for a 3rd runway to Heathrow (S).

Ryanair is to add routes from Edinburgh to Paris, Madrid, Palermo, and Cork.

Boeing predicts aviation will return to pre-pandemic levels on domestic routes by mid-2022, but with long-haul not recovering until mid-decade.

British Airways has operated its first flight using sustainable aviation fuel (SAF) between Heathrow and Glasgow. SAF is produced with materials other than crude oil and produces up to 80% less carbon emissions (S).

Lasers have been shone four times at aircraft in the skies above Edinburgh over last summer (S)

Shipping

International shipping is responsible for 3% of global CO2 emissions, but this is expected to grow to 10% by 2050 as other sectors cut emissions. The International Maritime Organisation has failed to get a grip on the shipping industry's greenhouse gas emissions (T).

Roy Pederson, a member of the Scottish Government's ferry advisory group, has called for one of the two unfinished ferries at Ferguson's shipyard, to be scrapped. Hull 802 for the Uig triangle, due to be in service by 2019, is not now expected until 2023. The total cost for the two ferries is expected to exceed £200 million (T).

CalMac has acquired a seven year old Norwegian ferry, MV Utne, for £9 million to help recover from some of the problems. It is expected to operate on the Oban-Mull route by next summer.

Buses, Cars and Roads

National Express, based in Winchester, is putting together a bid for its rival, Perth-based **Stagecoach**. National Express coach passenger numbers had risen to 52% of pre-Covid levels in the three months to the end of September.

Bus companies are to get up to £42 million of public funds between October 4th 2021 and March 31st 2022 as the coronavirus continues to hit ticket revenue (S).

A new junction on the M9 to serve housing developments at Winchburgh has been approved, due to open at the end of 2022 (S).

Disruption of buses from Campbeltown and Oban to Glasgow due to landslides at the Rest-and-be-Thankful is likely to continue as it is estimated a new road will take 7 to 10 years to build. Plans for a new route bypassing the landslide area are expected to be by the end of 2022 (EN).

There is concern that free bus travel for under-22s from 2022 could lead to higher bus fares for other passengers as bus companies will get less than half the fare re-imbursed by government.

Boris Johnson's plans for a tunnel between Scotland and Ireland have been scrapped after experts estimated it would cost up to £100 billion. Upgrading the A75 and A77 to Stranraer are seen as more realistic (T).

Bus companies across Scotland are experiencing a chronic shortage of drivers that threaten to restrict services until next year. Scotland's bus driver vacancy rate has doubled to 12.5% since 2019. First bus is still operating at only 85% of pre-pandemic level but will have to reduce services again in November (T).

Government support has helped keep West Coast Motors in profit during the pandemic. Revenue dropped from £28.6 million to £20 million but pre-tax profit rose from £552,000 to £2.5 million following almost £5 million of government grants (T).

Staff at Edinburgh Royal Infirmary have been warned that buses may no longer stop on the hospital campus at Little France as parking congestion is causing delays of up to 45 minutes (EN).

The Green/SNP power sharing deal includes a review of the environmental impact of dualling the A96 between Inverness and Aberdeen. Road charging and re-opening the Aberdeen-Peterhead/Fraserburgh railway will also be investigated (S).

SPT Chief Executive Gordon MacLennan has been replaced by Valerie Davidson after an alleged "car cloning" incident involving Mr. MacLennan (S).

Dependency on cars has hit a 15-year high, according to an RAC poll. Drivers in rural areas are more likely to claim to be car dependent (87%) than town and city dwellers (77%). (S) Petrol prices are near a record high of 142.5 p per litre (S). Sales of plug-in cars are now running at nearly 1 in 4 of new British car sales. Full electric cars in October made up 15% of new registrations, with plug-in hybrids making up a further 8%.

Motorists may have to face road charging to make up the £30 billion a year income from fuel duty. The DfT decarbonisation strategy made no mention of road pricing. But UK government sources said it was a "conversation" that needed to be had in public(T).

Rail

ScotRail has been accused by MSPs of sabotaging rail growth by proposing hundreds of service cuts. But transport minister Graeme Day said there could not be a never-ending increase in services with no consideration for the cost. Some little-used trains are being axed (EN).

On 5 October transport minister Graeme Dey said "We need to step back from some of the rhetoric that has been dominating the agenda of late and focus on trying to get a suitable outcome to this. But we are in a challenging position, financially. To put this in perspective, prior to the pandemic we were spending circa £1.1bn a year on Scotland's railways. We are currently spending north of £1.5bn. That isn't sustainable so we have got significant challenges"

First Group launched its Lumo cut-price Edinburgh-London train service on 25th October. Initially there will only be two services each way (one on Saturdays), increasing to five by early 2022 (EN).

Siemens is taking HS2 Ltd to court, claiming the £2.8 billion rolling stock contract, awarded to a joint venture comprising Hitachi and Bombardier, was unlawful. Siemens has built a new factory in Goole in the hope of winning the contract. Hitachi has a factory in Durham, and Bombardier build trains in Derby (T).

Rail freight operators have switched to diesel locomotives due to soaring electricity prices (S).

Rail unions have called for free train travel for people under 24 and over 60, like on buses (S).

Scotland Secretary Alister Jack has voiced dismay that the Scottish Government didn't engage with the Union Connectivity Review for trans-border links (S) (*SAPT made a submission to the review*).

Anglo-Scottish high-speed rail planning was put on hold 2 years ago. The strategic case will have to await the latest Strategic Transport Project Review (STPR2) (T). Cancellation of the Eastern leg of HS2 from Birmingham to Leeds will also affect Anglo-Scottish planning. The West Coast HS2 line to Crewe will be the only high speed route from London to the north.

The Office of Rail and Road (ORR) has found that cracks on the new Hitachi fleet of InterCity Express trains on East Coast and Great Western lines may have been worsened by the weather (T).

Tesco is planning to expand its use of rail freight to bring fruit from Spain into the UK, increasing the number of containers by rail from 65,000 to 90,000 per year (T).

Trainline reports its ticket sales in the UK in June, July and August returned to 95% of pre-covid levels, though overall rail usage is stuck between 60% and 65% (lower in Scotland).

Markle level crossing near East Linton is to be replaced by a £7.4 million bridge due to concerns that motorists will get frustrated by longer waits when East Linton station opens (S).

Repairs have had to be made to 133 sections of Edinburgh's tram line after concrete that should have lasted 50 years has crumbled under the weight of buses, this damage being fixed by contractor Bilfinger, which built the route that opened just seven years ago. The problem has been exacerbated by the heavy flow of double decker buses running along the route.

In an attempt to resolve the long running industrial action by RMT and other staff on ScotRail, an offer was made to staff of an initial 2.5 per cent backdated to April this year, with an additional 2.2 per cent promised in April 2022. There was also a separate offer on the table of a £300 bonus payment to all staff for ensuring that COP26 is fully supported between October 31st and November 12th. Unite called off the first of its strikes and would ballot its members, and RMT put weekend action on hold over two Sundays. However, accusing employers of having kicked the can down the road, RMT announced that ScotRail workers would strike from 1 to 12 November,

The Scottish Government said the offer would remain on the table for RMT members until 17:00 on Wednesday 27th October - a deadline the union described as like "having a gun pointed at our head". The minister was not optimistic that the strike would be averted: however, on 27 October following further discussion between ScotRail and RMT, the following agreement was reached:

- A one year pay deal comprising of a 2.5 per cent pay increase backdated to 01 April 2021.
- A payment of £300 to all staff ensuring COP26 is fully supported (separate agreement with full details on commitments is to be signed).
- A 3 hour book-on allowance applied to each rest day worked, applicable for 12 months from the date of this agreement.

By accepting this offer, it was agreed that all current disputes between RMT and ScotRail would be resolved and that all current and planned industrial action would be withdrawn immediately. The talks acknowledged the pressures on Scotland's railway, and both sides agreed that by working together and exploring future productivity initiatives they would be able to build a sustainable future for ScotRail. Ian McConnell, ScotRail Chief Operating Officer, said: "We have reached a pay agreement with the RMT trade union that resolves strike action. We look forward to Scotland's Railway playing its part in delivering a successful COP26 next week." Mick Lynch, RMT General Secretary, said: "Following further discussions between RMT and ScotRail an agreement has been reached and the proposals have been accepted by the union. As the disputes are resolved strike action has been cancelled and RMT members have been advised to work normally." Transport Scotland said "Following recent discussions we are pleased that all four trade unions have now agreed to accept this very good pay offer on behalf of their members. We are proud to have brokered and funded a deal which gives Scotland's rail workers a decent pay rise and improved terms and conditions, in contrast to conditions for rail workers under the UK Government. We are also pleased that the RMT reached out to restart discussions based on the offer that had been made to them on Sunday. Now an agreement has been confirmed the strike action will thankfully now come to an end. As well as getting the pay rise they deserve, railway workers can now go back to delivering rail services for people right across Scotland and as well as for those attending COP26. This will allow everyone who works in Scotland's Railways to play their part in welcoming the world to our country and showcase our efforts towards building a greener, cleaner railway."

6 Annual Report 2020/21 and AGM Elections

Annual Report presented at AGM on 17th September 2021

The Scottish Association for Public Transport was formed (originally as the Scottish Railway Development Association) in 1962 in response to Beeching threats to many of Scotland's railways. It is ironic that, after almost 60 years, rail services, after decades of growth, are again unexpectedly threatened by a collapse in usage as a result of the Covid-19 pandemic.

We now need to renew pressure to ensure public transport recovers and resumes growth. SAPT committee meetings ceased after the February 2020 meeting as the lockdown started, with the 2020 AGM in Perth cancelled. We restarted committee meetings via Zoom from July 2020. Eleven virtual meetings have been held up to August 2021. Not all committee members have been able to use zoom, due to lack of suitable computer equipment, though zoom has made it easier for others to participate without the need for lengthy journeys. This annual report covers this full period up to the August 2021 meeting.

The Scottish Government is providing emergency funding to keep rail, bus and ferry services running, at a reduced level on some rail routes. SAPT has had a virtual meeting with ScotRail to discuss the future timetables which will be radically reduced from pre-covid level due to the permanent drop in commuting. Our response to the timetable consultation recognises the need to cut rail costs but stresses the need for competitive yet economic rail services to attract greater modal shift from car in the future.

SAPT issued a paper calling for an integrated bus and rail network as a means of recovering public transport ridership and funding. SAPT chair John McCormick had a Teams virtual meeting with Transport Scotland Directors to discuss this in detail. More work is planned.

SAPT Vice-Chair Professor David Murray-Smith has continued with his pioneering simulation work for Arcola and the Scottish hydrogen train programme.

A number of webinars and virtual conferences have been “attended”. These include sessions by Transport Times, Rail magazine, Transform Scotland and Transport Focus.

SAPT responded to a number of consultations, including on STPR2 (Strategic Transport Projects Review), Air Passenger Duty, Union Connectivity, HS2 routes in the North of England and an HS2 depot at Gretna and routes, franchising policy for ScotRail (now to move to state operator of last resort), future design of ScotRail trains, LNER East Coast timetable redesign (now postponed), transport options for Glasgow, and access plans to Argyll and Bute (SAPT stressed better public transport in addition to upgrading the Rest and be Thankful).

The disappearance of paper timetables (including on station billboards), and the introduction of compulsory reservations on LNER trains are concerning and will be followed up by SAPT.

SAPT funds are healthy and are due to be boosted by a bequest from the family of a deceased SAPT member.

Thanks are due to SAPT Vice-Chair David Giles for migrating and upgrading the SAPT website, and for arranging the zoom meetings including the 2021 AGM. Thanks are also due to Scott Simpson for maintaining membership records and postal distribution of *Scottish Transport Matters*, Robin McGregor for looking after the accounts, David Brown for checking them, and Arthur Homan-Elsy for minutes.

John McCormick, SAPT Chair

16/9/2021

At the AGM on 17th September the office-bearers and committee were re-elected as follows:

President	Stewart Stevenson
Vice Presidents:	Tom Harris, Lawrence Marshall, Dr. Malcolm Reed
Chair	Dr John McCormick
Vice Chairs	Prof. David Murray-Smith, David Giles
Membership Secretary	Scott Simpson
Minutes Secretary	Arthur Homan-Elsy
Treasurer	Robin McGregor
Strategy Officer	David Murray-Smith
Regional Representatives:	
Strathclyde	David Brown, Stewart Leighton
Lothian	Paul Tetlaw, Graham Atkins
Borders	Prof. Chris Harvie
Southwest	Tom Hart
Central & Tayside	David Giles
Fife	Laurie Naumann
Highlands & Islands	Dr John Logie, Rolf Schmidt
Shetland vacant (meantime covered by H&I)	
Nestrans	vacant
Elected Member	Dr Ann Glen MBE

Neil Wallace was proposed and elected as a committee member.