



Glasgow City Council

**Environment, Sustainability and Carbon
Reduction Committee**

**Report by Executive Director of Neighbourhoods,
Regeneration and Sustainability**

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Item 4

22nd November 2022

ROADS INFRASTRUCTURE STATUS & OPTIONS REPORT 2022

Purpose of Report:

To advise Committee of the status of Glasgow's roads infrastructure and present investment requirements and scenarios.

Recommendations:

It is recommended that committee notes the issues and investment options detailed in the Annual Status & Options Report 2022 (Appendix 1) as this information feeds into both the Council's budget setting process and capital programme monitoring

Ward No(s):

Citywide: ✓

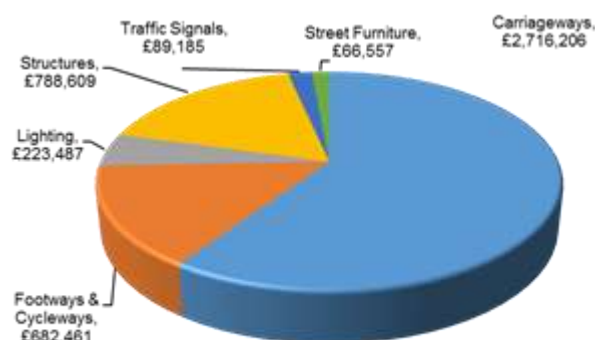
Local member(s) advised: Yes No ✓

consulted: Yes No ✓

1 Introduction

- 1.1.1 Glasgow City Council is responsible for the operation and maintenance of a significant road network and associated infrastructure. Effective management of this asset is of vital importance, in ensuring that we deliver the aims/outcomes of the Glasgow Transport Strategy such as the transition to a net-zero carbon, clean and sustainable city contributing towards tackling poverty, improving health, reducing inequalities and reducing car vehicle kilometres by at least 30% by 2030.
- 1.1.2 As part of the management of this significant asset, an annual review of the current condition is undertaken along with identifying options for investment. This is undertaken in line with national best practice produced by the Society of Chief Officers of Transportation in Scotland (SCOTS).
- 1.1.3 The Annual Status and Options Report (ASOR), attached as Appendix 1, sets out the condition of our road related assets and provides a means of identifying and prioritising the overall funding needs of each of the asset categories. The options and scenarios presented aim to assist with the budget setting process and identify where investment should be prioritised.
- 1.1.4 In this report, levels of service for assets have been assigned into gold, silver and bronze standards. The differentiation between these standards is as follows: -
- Gold standard – Levels of service, investment and condition towards an asset which is described as being an exemplar of road asset condition and serviceability with minimal demand for substantial maintenance budgets. To achieve to these standards a significant amount of investment would have to be implemented over a sustained period of time. This is an aspirational standard for all Road Authorities that would require significant investment over and above steady state for a sustained period of time.
 - Silver standard – A reduced level of service, investment and condition compared to gold standard which enables the service to consistently maintain an asset's condition at existing levels as a minimum but with the ability to marginally improve condition over the period of investment. This level of service will allow a roads authority to exceed its statutory duties and obligations. This is a standard that all Roads Authorities aim to achieve in modern times through the use of innovative and efficient methods to maintain each asset with a moderate investment over a period of 10 – 20 years..
 - Bronze standard – Levels of service, investment and condition below that of silver standard that allows for marginal deterioration of an asset in a managed way to ensure that any increase in future investment can be easily and efficiently introduced to bring an asset back to a silver standard whilst still meeting our statutory duties and obligations. This is a standard that all roads authorities must meet and deliver as a minimum each financial year with budgets available to ensure a safe and serviceable asset. This is the level at which the majority of our assets are at. There are no assets currently below this standard.

1.1.5 The cost of replacing all road infrastructure assets is currently estimated at £4.57bn. The pie chart below details the value of the assets broken down by asset type.



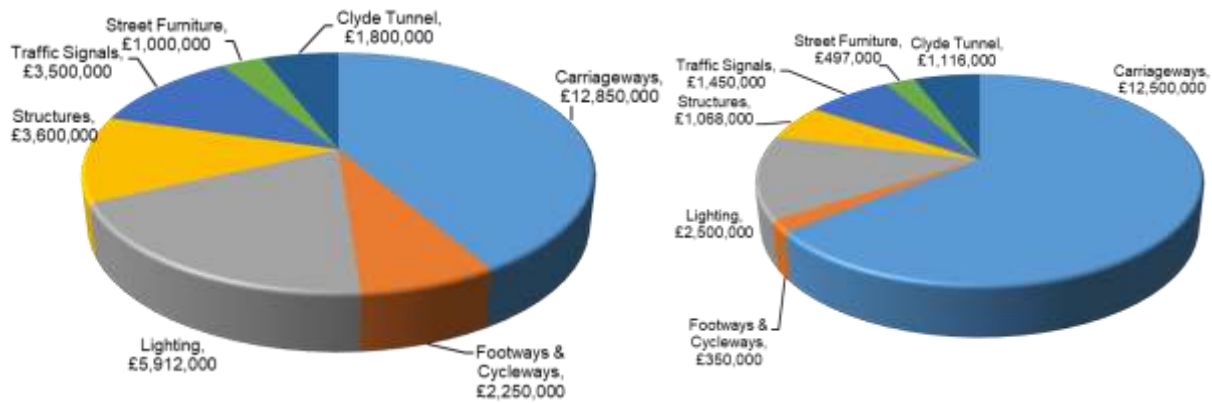
Gross Replacement Cost per Asset (£'000)

The level of investment required to maintain our road assets infrastructure at a level which is commensurate of a very good network is estimated at £30.9m per year; this equates to an annual investment of 0.68% of the total asset value. This is a level which would be classed as a Gold Standard of investment. Glasgow has made significant investment in roads assets in recent years to ensure that we maintain our road assets in the best possible condition within available budgets. For the purpose of this report, current level of investment is designated as bronze standard. The investment provided for our road assets over the last few years and anticipated investment for the next 2 years is detailed in the table below: -

ACTUAL SPEND							
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	Total
Roads	£9,187,332	£10,652,069	£6,762,559	£6,306,698	£6,500,000	£6,500,000	£45,908,658
Footways	£3,627,594	£2,684,763	£1,446,683	£842,996	£0	£0	£8,602,036
Traffic Signals	£9,704	£742,067	£836,972	£54,315	£72,941	£0	£1,715,999
Street Lighting	£1,300,116	£3,134,635	£1,853,370	£1,320,406	£1,975,386	£2,500,000	£12,083,913
Total Capital	£14,124,746	£17,213,534	£10,899,584	£8,524,415	£8,548,327	£9,000,000	£68,310,606

EXPECTED BUDGET		
	23/24	24/25
Roads	£7,500,000	£6,500,000
Footways	£1,600,000	£300,000
Traffic Signals	£500,000	£500,000
Street Lighting	£2,500,000	£2,500,000
Total Capital	£12,100,000	£9,800,000

The pie charts below illustrate and compare the annual level of investment required to maintain the asset at a silver standard against the current level of investment. It should be noted that the current investment only includes the additional budget allocation for the current year that can be attributed to works that will improve the condition of the asset and not cyclic or reactive maintenance budgets or budget allocations reported in previous years ASOR's.



Silver Standard Investment - £30.9m

Current Investment - £19.41m

1.1.6 It can be seen that current investment falls short of the estimated level required to maintain existing condition, although any deterioration is managed using asset management principles. Although investment is less than estimated to keep all assets at current condition, Officers continue to investigate new and more efficient ways to ensure that all assets remain serviceable and represent a safe and useable condition and ensure that existing funding enables this. This is true for each of the asset groups.

2 Asset Condition and Investment Options

2.1.1 The ASOR contains details of current asset condition and investment options for all of the road infrastructure asset categories. The following sections summarise the current condition indicators and preferred investment options for each of the main asset categories.

2.1.2 Carriageways

- The latest condition data indicates that the condition of our carriageways improved in the last 12 months with 71.7% of our carriageways in acceptable condition. This shows that **Glasgow remains one of the best performing Road Authorities in the Country when compared to the latest available Scottish average of 64.2% of carriageways** in acceptable condition.
- Customer satisfaction has fallen, and this is attributable to the fact that our assets have suffered from extreme weather events over the last 18 months with severe rainfall and freezing temperatures. In addition, most residents

continue to be home working and are reporting more frequently issues that do not meet our criteria for repair.

- There is a view locally and nationally that the impact of work undertaken by utility providers in maintaining and installing new apparatus has had an impact on the condition of road assets. Statutory Undertakers have the right under the New Roads and Street Works Act 1991 to install, access or maintain their apparatus in the public road and do not require permission from Glasgow City Council to carry out their works.
- There are a number of ways that Glasgow City Council ensure that works and reinstatements carried out by Statutory Undertakers are acceptable. Sample inspections are undertaken by GCC to monitor the overall performance of Statutory Undertakers as per the New Road and Street Works Act 1991 “Code of Practice for Inspections”. This involves the inspection of a random sample of roadworks at three stages, both during the works and the guarantee period to ensure that the reinstatements are acceptable. Sample inspections allow Glasgow City Council to monitor levels of compliance against prescribed standards. Under Section 129 of the New Roads and Street Works Act 1991, all reinstatement works carried out by Statutory Undertakers must comply with the “Specification for the Reinstatement of Openings in Roads”. In 2021/22, we have carried out over 2,100 Sample Inspections on Statutory Undertaker works to date.
- Glasgow City Council are also part of the National Coring Programme. This programme is carried out periodically throughout Scotland and involves taking cores of completed reinstatements in the public road. These cores are then scrutinised to ensure compliance with standards with a view to achieving continual improvement in reinstatement quality.
- Glasgow City Council are currently participating in consultation with the Scottish Road Works Commissioner’s office to extend the maintenance period of reinstatements from 2 years to 6 years.
- Current level of investment remains steady to provide levels of service and condition that allows for marginal deterioration of the asset in a managed way. This ensures that any increase in future investment can be efficiently introduced to bring an asset back to a Silver Standard whilst still meeting our statutory duties and obligations. We are managing the condition of all assets by implementing innovative processes and preventative treatments which extend the life of the asset, but do not necessarily address any underlying structural issues.
- To enable Glasgow City Council to further improve its performance nationally, an increase in investment from the current £12.5m to £14.5 million per annum, sustained over a five year period, would improve condition significantly, reducing the ongoing cost of maintenance to £11.1 million per annum thereafter. Officers will continue to manage all assets to a serviceable condition using existing processes and will investigate any future innovations to further assist. Further modelling of road asset

deterioration will be undertaken to provide further accurate information as to what future investment may be needed in line with the Council's aims to reducing car vehicle kilometres by at least 30% by 2030.

2.1.3 Footways

- Footways are vital for nearly all journeys, but are particularly important for the most vulnerable in society who may not have easy access to private or public transport. Our most recent footway condition data indicates that our footways have remained at a steady state in the last 12 months. 81.2% of our footways are in either a good or fair condition. 2.9% (approximately 92km) of our footways exhibit major or structural deterioration and 15.9% (approximately 498km) exhibit minor deterioration such as cracking and oxidisation. Again, this is attributable to the fact that the Council has suffered from extreme weather events over the last 18 months with freezing temperatures and severe rainfall. In addition, most residents continue to be home working and are reporting more frequently issues that do not meet our criteria for repair.
- Recent investment has enabled our Roads teams to keep footway conditions at a good level, resulting in less tripping claims and improvements in our public realm areas. Given the importance of footways for active travel, continued investment at current levels will enable the Council to maintain the relatively good condition of these assets and if possible, a sustained investment of circa. £3 million per annum would ensure best value over the 20 year life and further improve footway standards throughout the City and exceed our statutory requirements.
- Glasgow's footway condition figures have remained fairly static and are in line with Scotland's other major cities.

2.1.4 Cycleways

- Over the past few years, there has been significant investment in new cycleway infrastructure. Latest condition data indicates that 94% of the primary cycle network is in good or fair condition which has remained static in the last 12 months and is reflective of the relatively young age of the asset.
- We continue to develop our cycle network with funding secured to expand the "City Ways". These projects will provide safe, high quality cycle routes linking our neighbourhoods' with the City Centre.
- New assets require less maintenance funding in the early years, but as time progresses and the assets age, an increasing level of investment will be required. At present, the modelling suggests that an investment of £55,000 per annum is sufficient to maintain the asset in the existing good condition. This is already addressed in current investments and results in this asset having a Silver Standard.

2.1.5 Street Lighting

- Around 38% of Glasgow's 73,750 street lighting columns remain beyond their Expected Service Life (ESL). Due to recent investment into street lighting column replacements, this figure has remained steady in the last year, as a result of this ongoing renewal programme.
- A Risk Management Strategy has been implemented to ensure those columns most at risk of failure are prioritised for replacement.
- There are considerable issues associated with ageing cabling, particularly overhead cables, which cannot be addressed with the current funding.
- With recent investment in our lighting stock, where LED's have replaced approximately one third of our lighting stock, and our maintenance policy of replacing any damaged old sodium lanterns (orange-coloured lamps) with LED lights, we have continued to make inroads to reduce our energy consumption and deliver savings against the Council's reduction in CO2 emissions targets. The further progression of installing LED lights has also enabled the Council to introduce lights which depreciate at a much slower rate than other alternatives, reduce long term maintenance costs and improve lighting levels.
- Although the service is operating as Bronze Standard, meaning we are meeting our statutory duties and making lighting stock safe and serviceable, continued investment of around £6.5 million per annum over 14 years would be required to address longer term issues, achieve a good asset condition and raise the asset to silver standard.
- Current continued investment in street lighting, resulting in a further £7.5 million over the next 3 years will continue to ensure that the Council provides a safe and serviceable lighting service and will maintain progress with replacement LED lighting.

2.1.6 Traffic Signals

- There are 908 traffic signal installations in Glasgow with around 26% assessed as being in need of replacement in the next 5 – 7 years.
- Previous year's investment has allowed the upgrade of a number of safety critical sites.
- An annual investment of £3.5m is required to maintain and/or replace assets which are assessed as poor condition but still serviceable.
- A significant investment of £27.5 million over 5 years should also be considered to replace all ageing installations and provide modern low energy LED lights along with fully compliant tactile paving and indicators.

- The introduction of LED traffic signals has further reduced the Council's energy use, reduced CO2 emissions, reduced maintenance costs and significantly improve traffic signal operations with a significant reduction of incidents of traffic signals not working due to failure of components.

2.1.7 Structures

- The Council is responsible for maintaining 395 bridges and other structures throughout the City. Overall condition is rated as 'Fair', but the most critical elements are rated as 'Poor' which indicates that there is risk of deterioration if maintenance work is not undertaken. Maintenance priorities are targeted to ensure structures remain safe, serviceable and useable.
- The top priority remains the strengthening of the Shieldhall Overpass and £4.5million of funding has been secured for the financial year 2024/25.
- In order to strengthen and repair the structures in the worst condition, an annual investment of £4.5M is required for a 20 year cycle. Medium and long term programmes would allow the removal of lane and weight restrictions throughout the city and improve the Bridge Stock Condition Indicators

2.1.8 Clyde Tunnel

- The Clyde Tunnel and its approaches require significant investment to address necessary repairs to operational infrastructure and structural issues.
- The funding Glasgow receives for the operation and maintenance of the Clyde Tunnel is the same amount per kilometre as for a standard stretch of local road. Due to the operational and regulatory requirements of the Tunnel this equates to annual shortfall of approximately £820,000. NRS Officers have held discussions with Transport Scotland about addressing this shortfall and although no additional funding is forthcoming officers are continuing to work on a business case to try and assist future bids for funding.
- During the last 12 months, the Tunnel has had some significant improvement works undertaken upon it. These are listed as;
 - New modern LED lighting installed - Our electricity supplier has indicated a 50% saving has been achieved on our typical 94,000 kWh monthly usage for lighting at the Clyde Tunnel after introduction of LED Lighting.
 - The analogue PABX internal & SOS telephone was updated in September 2022 to a modern IP internal telephony system with enhanced routing features, call recording, fault reporting and integration with Supervisory Control and Data Acquisition (SCADA) systems.
 - A new Video Automated Incident Detection (VAID) system was installed in October 2021 and integrated with the SCADA improving traffic control and incident detection. The system was extended further in July 2022 to enhance ramp & portal visibility.

- The ASOR identifies the key prioritised investment needs for the Tunnel. Over the next 12 months, the following works have been programmed for the Tunnel;
 - A new Fire Control system installed by early 2023. This fire control system will also be fully integrated within the new SCADA system.
 - Variable message signing (VMS) and improved traffic control is required to provide compliance with Design & Refurbishment Code of Practice for Roads Tunnels (CD352). Funding of £950k was provided from Capital Investment programme for 2023/24 & 2024/25 to proceed with installation via tender.
- NRS Officers in Roads and Technical Services have assisted in developing a bid that has been submitted to UK Government's Levelling Up Fund. Included in this bid is a request for significant investment to address issues detailed above and to improve the aesthetic condition of the tunnel.

2.1.9 Asset Repair Collaboration

- Our roads, street lighting and traffic signals teams meet regularly to coordinate planned works and align priorities. The recently commenced ETAC meetings help ensure that these are cascaded service wide and that priorities can be aligned with colleagues in Cleansing, Streetscene, Road Safety and the aspirations of the local community. These meetings ensure that opportunities for collaborative working can be considered and assessed and that these decisions are recorded and tracked.

2.1.10 Carbon Reduction

- Several investment options and initiatives in the different asset categories have carbon reduction benefits; officers continue to explore new materials and techniques to reduce carbon emissions from all road asset operations. Examples of what is being investigated is listed below: -
 - We are aiming to reduce the environmental impact of road surfacing operations. Much of the material removed is already recycled back into road materials and officers are actively pursuing the use of new 'warm mix' asphalts which significantly reduce the carbon footprint, potentially reduce disruption and improve road worker safety whilst having no negative effect on long term durability.
 - LED streetlights consume significantly less energy than traditional incandescent lamps. All column replacements will include the installation of new LED lanterns. This will improve the efficiency of the lighting network and contribute towards the Council's corporate sustainability objectives by reducing energy consumption and carbon emissions. However, it is worth noting that due to continually increasing energy costs, the reduction in energy consumption is not expected to lead to a reduction in energy costs. In fact, it is predicted that energy costs will continue to rise for the foreseeable future.

- Investment in LED traffic signals will similarly reduce energy consumption.
- New dual fueled low carbon interchangeable Winter Fleet
- Trial of a Hydrogen fueled multifunctional tractor used for planing and de-icing

2.1.11 Climate Adaptation

- Flood risk and climate change present a significant environmental risk to the City. Climate change has implications for the road drainage systems, with higher intensity storms predicted to become more frequent. A storm which the City experienced in August 2021 was identified as being a 1 in 200 year storm event and resulted in a significant number of locations which have had identified capacity issues within the drainage infrastructure. During August 2020 Glasgow experienced a 1 in 600 year storm event which saw the number of blocked gully reports increase to 608, compared to 489 in August 2019, which was the wettest on record, and 160 in August 2018.
- The Council is making significant investment in reducing flood risk and increasing drainage capacity. Three City Deal programmes have a reduction in flood risk and increased drainage capacity as an objective including the City Centre Avenues, Canal & North Gateway Smart Canal and MGSDP. The MGSDP City Deal project alone is a £47.5m investment across 14 sites where a range of interventions as part of surface water management plans including upsized watercourse channels, basins, surface water sewers, below ground storage and raingardens are being delivered.
- The condition of the existing road surface water drainage assets is largely unknown due to its age. It is therefore difficult to predict future investment needs. However, based on average scheme costs in the past few years, it is estimated that investment of £500,000 per annum could be considered assist in addressing the issues that are identified. Current investment is already undertaking this process but an increase in this investment would allow for more of this work to be undertaken.
- The NRS Roads Maintenance teams have now implemented its 'risk-based' gully cleaning programme which will provide a targeted approach to ensure that gullies that need to be cleaned are attended to in a timely manner. The new gully cleaning regime will be undertaken using the following frequencies;
 - Flood location gullies – every gully in a location previously identified as susceptible to flooding will be cleaned 3 times a year
 - Arterial and city centre routes – every gully assessed as needing cleaning due to the amount of debris in the gully pot will be cleaned once per year

- RPZ and neighbourhood routes – every gully assessed as needing cleaning due to the amount of debris in the gully pot will be cleaned once every 2 years
- Leaf fall locations – swept weekly during autumn period.

3 Council Motion – March 2022

On Thursday 31st March 2022, a Motion was raised at full council regarding the condition of the City's roads and footways. It was agreed at the time that the provision of the questions raised would be subsequently answered within the publication of the 2022 ASOR.

The questions raised were as follows along with a reference to the answers within the ASOR or other documents: -

- An up-to-date assessment of the cost of repairing ALL of the city's identified road and pavement defects to allow the Council to come to a point where it only requires to undertake repairs to new defects – noting that much of this detail should already be available to the Council as it is utilised within its RISO report.
 - *This information is listed on page 6 section 2.1 of the 2022 ASOR*
- An assessment of the impact of third party works on the city's infrastructure e.g. utility works and how the Council can best ensure that these parties rectify any damage caused by these works.
 - *This information is listed on page 8 section 2.1 of the 2022 ASOR under the heading of **Third-Party Works on Glasgow Road Infrastructure***
- An assessment of the potential to link up a programme of significant road and footway repairs with carrying out other works such as drainage repair/upgrades or traffic changes.
 - *This information is listed on page 6 section 1 of the 2022 ASOR*
- An assessment of the capacity of both the Council and its contractors to undertake such a scale of work and on what timeframe this could take place.
 - *This information is listed on page 6 section 2.1 of the 2022 ASOR*
- To write to the Cabinet Secretary for Finance and the Economy providing her with an up-to-date estimate of the cost to repair Glasgow's roads and footways and the required capital/revenue to allow this to be carried out and to further request that the Scottish Government take this into consideration as part of Glasgow's funding settlement in future financial years.
 - *This will be undertaken following completion of the report of the 2022 ASOR to ESCR*

- An assessment of the potential ways in which to fund this that are available to the Council in the short, medium and long-term.

- *This information is listed on page 5 section 1 of the 2022 ASOR*

4 Conclusion

It is vital that our roads infrastructure assets are effectively managed and maintained to enable Glasgow to deliver on its Strategic and Policy objectives. The different investment scenarios associated with each asset group are detailed within the Appendix and summarised in the table below. The 2022 ASOR has provided evidence that the Council is managing its road assets correctly and effectively with a number of assets remaining in a steady state condition compared to last year and demonstrated an improvement in condition in carriageways. This highlights that officers are using the available investment to ensure that the Council's most valuable asset is fit for purpose and safe and serviceable for all to use.

Summary of Investment Options

Asset Group	Investment Option	Projected Outcome
Carriageways	£72.5m	An annual investment of £14.5m for 5 years would lead to the Glasgow road network being in the best condition in over a decade.
	Over 5 Years	
Footways	£18.9m	An annual investment of £3.78m would remove all footways exhibiting major defects and structural deterioration.
	Over 5 Years	
Cycleways	£55k	An annual investment of £55k would enable the condition of the primary cycle network to be maintained.
Road Drainage Systems	£500k	An annual investment of £500k would enable identification, investigation and repair of all reoccurring road drainage defects throughout the City to continue.
Street Lighting	£69.1m	An annual investment of £13.82m for 5 years will replace up to 21,000 'at-risk' columns and associated cabling in poor condition.
	Over 5 Years	
Street Lighting	£91m	An annual investment of £6.5m for 14 years will replace up to 28,000 'at-risk' columns and associated cabling which would substantially improve the infrastructure condition.
	Over 14 Years	
Traffic Signals	£27.5m	An annual investment of £5.5m for 5 years will convert all traffic signal junctions with old incandescent technology to LED's and the installation of tactile paving at all junctions and pedestrian crossings.
	Over 5 Years	
Traffic Signs, Lines and Street Furniture	£100k	An annual investment of £100k for 16 years would repair all traffic signs, lines and street furniture in urgent need of replacement.
	Over 16 years	
Structures	£90m	An annual investment of £4.5m over a 20 year period would allow for the structures in the worst condition to be targeted for repair.
	Over 20 Years	
Structures	£134m	An annual investment of £6.7m over a 20 year period would improve the condition and performance of the structures stock condition indicator.
	Over 20 Years	
Clyde Tunnel	£14.02m	An investment of £14.02m would allow for the repair of operational infrastructure and structural issues.

2 Policy and Resource Implications

Resource Implications:

<i>Financial:</i>	Investment options are detailed within the report.
<i>Legal:</i>	None
<i>Personnel:</i>	None
<i>Procurement:</i>	None

Council Strategic Plan: Investment in road infrastructure supports economic growth, supports the delivery of a vibrant and sustainable low carbon city and improves accessibility for the city's most vulnerable people. This report is aligned to CSP priority numbers 54 and 66.

Equality and Socio-Economic Impacts:

Does the proposal support the Council's Equality Outcomes 2021-25? Please specify.

Yes

What are the potential equality impacts as a result of this report?

(no significant impact, positive impact or negative impact)

Please highlight if the policy/proposal will help address socio-economic disadvantage.

The preferred investment options presented within the report are expected to have a positive impact, particularly on those with physical disability and sensory impairment.

Climate Impacts:

Does the proposal support any Climate Plan actions? Please specify:

The proposal supports the Climate Plan through the improvement of infrastructure for walking and cycling. Under Theme 3 of the

plan, the proposal will support decarbonisation of transport systems by helping to improve infrastructure for walking, cycling, wheeling and reducing the need to travel.

What are the potential climate impacts as a result of this proposal?

The impacts of this proposal will have a positive impact in assisting the Council in addressing climate issues.

Will the proposal contribute to Glasgow's net zero carbon target?

Yes the proposal will contribute to Glasgow's net zero carbon target.

Privacy and Data Protection Impacts:

None

3 Recommendations

Notes

- 3.1 It is recommended that committee notes the issues and investment options detailed in the Annual Status & Options Report 2022 (Appendix 1) as this information feeds into both the Council's budget setting process and capital programme monitoring.