

Report of the Acting Director of City and Environment Services

Traffic Systems Asset Renewals and Detection Equipment Plan

Summary

1. This report presents a plan for structured renewals of traffic signals across the city, which a recent asset condition assessment has shown are in need of significant investment.
2. The city has 122 traffic signal installations including 54 signalised pedestrian crossings. The recent condition survey has indicated that there is a significant backlog in the maintenance of the equipment. This report proposes a programme of renewals to ensure that the backlog is addressed and the traffic signals continue to operate to the level required.

Recommendations

3. The Cabinet Member is requested to :
 - i. Approve the commencement of the Traffic Signal Asset Renewal Programme as outlined in this report

Reason: To ensure the City traffic signals equipment is up to date and the costs and risks to the Council of maintaining an increasingly aged asset are mitigated.
 - ii. Approve the continuation of the current programme of provision of new detector equipment.

Reason: To ensure effective and reliable detection equipment is provided at traffic signal junctions in York for the benefit of road users.

Background

Traffic signals asset renewal

4. The equipment present at York's traffic signal sites is ageing and in many cases has either reached end of life, or is in poor condition. This situation has arisen because for many years maintenance has been arranged on a 'repair and maintenance' basis and the focus has been on repairing and operating the equipment we have. Although York's traffic signals are safe and generally reliable, activities have focussed on repairing faults and dealing with immediate issues rather than taking a structured approach to addressing underlying asset condition.
5. Although this approach has served the City well in the past and has kept the revenue commitment required to maintain signals down to acceptable levels, a point has now been reached at which a more structured methodology is needed. It is considered that significant capital investment is now needed to renew the asset base and protect against the risk of increasing unreliability and rising maintenance costs.
6. This proposal is to adopt a more formal risk based approach to asset maintenance and to structure the replacement of life-expired on-street equipment into a single programme funded from LTP capital funds. This will be based on work completed in summer 2015 that produced a detailed asset database for traffic signals, which examined the age and condition of every signal site in the City. This approach will ultimately lead to reduced ongoing revenue requirements in the future, through reduced maintenance risk and higher levels of standardisation.
7. Over the years, signal equipment renewals have taken place on an ad-hoc basis, generally as part of larger improvement schemes. The approach has been to secure funding within other transport schemes, or developer led highway improvements to renew and upgrade affected traffic signal sites. This approach has resulted in a number of the City's key junctions being improved over recent years but because it only affords the opportunity to renew signals where other schemes are being delivered, it does not allow a programme targeted on need (in terms of signal age and condition), to be formulated.

8. The opportunity of a structured renewals programme will also allow for increased standardisation to be brought to York's traffic signal assets. The design work required to install new equipment, junctions and crossings affords the opportunity to increase capacity where possible, redesign poor existing layouts, ensure all sites meet current safety and operational guidance and ensure sites use (as far as possible) standardised layouts and equipment. This will help to improve the efficiency and safety of the road network for all users and through standardised equipment lead to reduced operation and maintenance costs.

Traffic Signal Detector Equipment

9. Allied to the above, a solution is proposed to deal with the poor levels of vehicle detection operative at traffic signal sites in York, and the effect this has on the efficiency of the network. Traditionally, vehicle detection at York's traffic signals has relied on induction loops installed in the road surface, but this method can suffer from poor reliability.. As in many Cities, ensuring an adequate level of carriageway maintenance for loop operation to remain reliable has proved to be too onerous a task for the Authority to effectively manage over the long term. This means that many traffic signal sites are not able to operate in the most efficient 'vehicle actuated' mode because they are not able to detect passing vehicles.
10. Recently capital has been invested in renewing road surface and replacing induction loops. £400,000 of capital funding was allocated for this purpose in 2014/15 and although this did result in vehicle detection being restored at five junctions, it is considered that this proved to be an extremely expensive method of achieving this outcome, (given the need to renew the road surface before the loops can be replaced). Therefore a method that does not rely on maintaining junction carriageway condition above that of surrounding roads has been sought as a more sustainable way for ensuring vehicle detection can be restored at large numbers of sites across the City.
11. Trials are now underway of 'above ground' detection technologies using video and thermal camera systems. These have the benefit of not being reliant on road condition and so although more expensive to install and possibly requiring improvements to on site ducting networks, they are more reliable and long-lived. This technology is increasingly being adopted as standard in the UK,

with Transport for London and Liverpool City Council as two significant examples. It is therefore proposed that this technology is rolled out across the City as single package.

12. The above proposals are linked and will be best delivered as part of a major re-provisioning of York's traffic signal assets through procurement of;
 - A standard signal junction and crossing renewals 'package', together with ongoing maintenance support.
 - A standard above ground detection solution (with maintenance), for installation at sites across the City
13. This will involve two capital procurement exercises to run concurrently. For the traffic signal asset renewal, it is proposed to procure a supplier who would deliver renewals over a number of years inline with an agreed spend profile. In the case of the signal detection project, a supplier would be appointed to deliver, fit and commission detectors over a two year period. For both projects, detailed programmes of work will be developed on a yearly basis and reported through the annual capital programme reporting process.
14. Although best delivered as separate programmes, the asset renewal and detector provision will in some, but not all cases apply to the same locations. This will require coordination between the contractors for the two schemes. The detector procurement programme will treat a larger number of sites than the renewals programme and so it is likely that detectors will be fitted at sites that may in a few years time require full renewal. In such cases the detector equipment will be capable of removal from the old installations and refitting to the new.

Consultation

15. As this is primarily a technical engineering exercise, it is not considered that consultation with the public or external stake holders is required. However, consultations have been held with a number of industry sources and local authority traffic signal officers to determine the most appropriate way forward. In particular, officers have sought the advice of Liverpool City Council, who are currently three years into a similar programme of signal asset renewals and standardisation.

Options

16. Recent work by the Transport Systems Team has produced an asset database of all on-street equipment managed by the Team. This also included determining asset age and condition and this has allowed the degree to which York's assets are 'end of life' to be assessed. This determination has looked at both the design life and current condition of equipment and from this a list of sites where equipment replacement is over due has been drawn up.
17. This analysis has shown that there is a significant backlog in equipment renewals. Between 2016-17 and 2020-21 (assuming a five year programme), 19 traffic signal junctions and 28 signal controlled crossings will be beyond their manufacturer's design life and be more likely to need replacement. The profile shown in Table 1 below illustrates the backlog of sites requiring attention now, in that 12 junctions and 18 crossings require attention in year one, and once this backlog is dealt with, the number drops significantly through the rest of the programme.

	Total sites needing renewal, 2016 to 2021	Total sites needing renewal, 2016 – 2017	Total sites needing renewal, 2017 - 2018	Total sites needing renewal, 2018 – 2019	Total sites needing renewal, 2019 - 2020	Total sites needing renewal, 2020 - 2021
Traffic Signal junction sites	19	12	1	1	1	4
Mid-block sites, (Pelican and Puffin Crossings)	28	18	0	0	0	10
Total	47	30	1	1	1	14

Table 1 – Sites requiring renewal 2016 to 2021

18. This profile, with the majority of work being required in year one would be very difficult to deliver. It would require widely differing levels of resourcing from the supplier throughout the project and would be far too disruptive to York's road network. Therefore, it is proposed to spread the work out evenly over the life of the programme to achieve a 'flat' profile that is more easily resourced and managed.

19. Details of the programme, and the order in which individual site are treated will be agreed on a yearly basis and will be reported through the capital programme reporting process. The data already collected as part of the signal asset database will be used to ensure sites are dealt with at the most appropriate time whilst still keeping to a flat spend profile.

Procurement

20. It is proposed to award a single contract for the signal renewals programme work.
21. The strategy adopted for delivering this needs to balance sufficient flexibility in delivery and ownership, against commercial and market attractiveness, to ensure we are able to maximise the benefits to the City whilst minimising overall cost.
22. Subject to confirmation from the Council's procurement team it is anticipated that the work will be procured using a contract for the delivery of the first year's programme and a 'call off' element for the remaining years. The follow-on years (years 2 to 5), will be included as an outline commitment with the detailed delivery programme to be agreed on a yearly basis. This approach will also ensure that the contractor has a good understanding of the likely workloads in future years and the Council's commitment to it and so will ensure the necessary resources are in place
23. The opportunity will be taken to not only renew life expired equipment but also review the physical and operational characteristics of the sites and make improvements as necessary. As part of the design process expected of the contractor, all renewals would be required to be to current standards in terms of equipment, safety and accessibility. Additionally the renewals process will present the opportunity to modify junctions where appropriate to increase capacity, better serve public transport needs and enhance provision for cyclists, pedestrians and people with disabilities.

Traffic Signal Detection Equipment.

24. For the Traffic Signal Detection project the installation and maintenance will be let as a single contract. This will be let as a call-off contract, allowing the Council to procure equipment on a site by site basis as and when needed. It also means that the

scale of the roll-out of this technology can be matched to the LTP capital available and spread over a number of years.

25. It is intended to procure this project separately from the traffic signals asset renewals programme as it is likely to attract different suppliers. Procuring it as part of the renewals programme would require the main renewals supplier to subcontract this work to specialist companies we can contract with directly by undertaking a separate process. However, the call-off nature of this contract will allow it's delivery to be fully integrated with the delivery of the renewals programme.
26. This contract will comprise two elements; the equipment provision and installation and the civil engineering work required to ensure junction duct networks are capable of taking the new cabling required. These will be let to a single contractor but with the likelihood of one of these elements being subcontracted. Although the Traffic Signal Asset Renewal and Detection Equipment project are best kept as separate projects, there will be some cross-over were both projects affects the same signal sites.
27. This will specifically be around civil engineering activities such as ducting and in such cases, the work will be coordinated to ensure this is achieved most cost effectively and without abortive work. It is proposed to allocate funds for the initial stages of the project in 2015/16 to enable prompt commencement of the overall programme.
28. At present an indicative programme for Asset Renewals of £100,000 for 2015/16 and £400,000 per annum for 2016/17 to 2020/21 is proposed. For the Signal Detection Equipment programme, £220,000 is allocated in the capital programme for 2015/16 and £100,000 per annum for 2016/17 to 2018/19 is proposed.

Analysis

29. The contracts awarded will be for the design, supply and maintenance of the equipment. This will minimise the resource requirement on the Council in undertaking this project and, by allowing bidders to design their own solutions, lead to innovation and best value. Similarly, tying the maintenance into the supply

and assessing future year maintenance costs as part of the bidding process will drive future year costs down.

30. Awarding the contract for asset renewal for delivery over five years will provide the most flexible option for the Council, in terms of the ability to adjust the programme to reflect events. It is also the most realistic option in terms of what suppliers can be expected to deliver. Expecting the programme to be delivered in a single year would lead to resourcing issues for the suppliers and may lead to increased costs and reduced certainty of delivery.
31. The proposal to award the first years lot with the remaining years included as a call-off provision gives the Council the flexibility of not being tied into a fixed programme but also gives the supplier some certainty the size and value of the overall scheme, a fact which is likely to be reflected in the unit costs provided.

Costs

32. For a five year asset renewals programme, the yearly costs and delivery requirements would break down as shown in Table 2 below;

Proposed budget 2015 - 2016	Spend profile 2016 - 2017	Spend profile 2017 - 2018	Spend profile 2018 - 2019	Spend profile 2019 - 2020	Spend profile 2020 - 2021
£ 000's	£ 000's	£ 000's	£ 000's	£ 000's	£ 000's
100	400	400	400	400	400

Table 2 – Renewal costs and profile

33. This estimates the total likely cost of the renewal of the sites that become end of life in the period 2015 to 2021, which is £2.1m and proposes a spend profile based on this being delivered over the financial years 2016/17 to 2020/21. This would need to be allocated within the capital programme over the years indicated.

34. A reallocation of £100,000 to this programme is proposed in the City and Environmental Services Capital Programme – 2015/16 Monitor 1 Report for development work. This will allow preparatory work in areas such as data gathering, procurement and specialist engineering support to be commenced ahead of the main expenditure in the years 2016/17 to 2020/21.
35. There is an allocation in the 2015/16 capital programme for traffic signals detector renewals of £220,000, (£20,000 for preparatory works and £200,000 for equipment procurement). Based on costs experienced during the recent trial installation of this equipment, it is estimated that a cost of £10,000 per site for this work is reasonable. This means that 20 sites will be treated this year. Therefore, to treat the 50 sites in the City that require this technology, a further 3 years capital funding at £100,000 per annum is required. Table 3 below details this proposed programme;

	Allocated budget 2015 - 2016	Spend profile 2016 - 2017	Spend profile 2017 - 2018	Spend profile 2018 - 2019
	£ 000's	£ 000's	£ 000's	£ 000's
	220	100	100	100
Number of sites to be treated	20	10	10	10

Table 3 – Proposed allocation for detector procurement

Linkages into current and ongoing traffic signal maintenance

36. As the asset renewals programme will not affect all signal sites in the City, but only those at end of life, there will be a need to continue current maintenance for the remaining sites.
37. The current maintenance arrangement, which operates as a stand-alone traffic signal maintenance contract will expire in 2016. It is proposed to re-let this, but with a provision included for a

steady reduction in the assets it covers. This will allow sites to be handed over from the signals maintainer to the asset renewals contractor as and when the programme requires.

38. The re-let traffic signals maintenance contract will be let for a period that ties in with the end of the asset renewals programme in 2021. Therefore, as the renewed sites enter their contracted maintenance period, there will be an opportunity to incorporate the un-renewed sites in this arrangement, carry on with two separate arrangements or restart the renewals process to pick-up sites that become end of life after 2021.
39. By adopting this approach, the Council retains the ability to be flexible and determine nearer the time how to deal with signals asset renewals after 2021. Obviously the number of sites requiring treatment will be lower because the historic backlog will have been dealt with, but it is likely that some arrangement will need to be put in place to prevent this situation arising again.
40. It is considered prudent that this decision is left until nearer the end of the current programme, but with the flexibility outlined above. The requirements beyond 2021 are not predictable at this stage and to tender work that is so far in the future would not be cost effective.

Council Plan

41. This proposal will allow the Council to deliver a better service to residents and visitors by improving the effectiveness, safety and reliability of the City's traffic signals.
42. This will in turn increase the efficiency of the road network within the City to the benefit of public transport, car drivers and pedestrians and cyclists.
43. It will also reduce the amount of revenue the Council spends on traffic signal maintenance and in dealing with failures at traffic signal junctions. In meeting these objectives this proposal will help deliver a better transport network and contribute to growing the City's prosperity and attractiveness.

Implications

Financial

44. The costs for these proposals will be around £2.620m, over six years. Of this, £220,000 for detector equipment is already allocated in the capital programme for 2015/16 and a further £100,000 is recommended for allocation for asset renewals preparatory work in the 2015/16 Capital Programme Monitor 1 report.
45. It is proposed that the remaining amount will be drawn from the Council's Local Transport Plan (LTP) Integrated Transport Block capital allocation for the years 2015/16 to 2020/21. The LTP Integrated Transport Block allocation to the Council from the Department for Transport is £1.57m each year up until 2020/21 (2016/17 -2017/18 confirmed, 2018/19 – 2020/21 indicative). The proposed allocation to the asset removal programme represents an approximate 30% reduction in funding available for other transport improvement measures however it is considered that the provision of a high quality, reliable network of traffic signals is fundamental to minimising the impact of congestion across the city. Alternative funding sources will need to be identified if the indicative DfT funding allocations are not confirmed.
46. The combined spend profile for both proposals is shown in Table 4 below;

	2015 - 2016 (already programmed)	2016 - 2017 allocation	2017 - 2018 allocation	2018 - 2019 allocation	2019 - 2020 allocation	2020 - 2021 allocation
	£ 000's	£ 000's	£ 000's	£ 000's	£ 000's	£ 000's
Traffic Signal Asset Renewals	100	400	400	400	400	400
Traffic Signal Detector Procurement	220	100	100	100	0	0
Total	320	500	500	500	400	400

Table 4 – Combined spend profile

47. Investing this capital in the traffic signal asset will have a direct financial impact in reducing the Council's yearly revenue spend on traffic signal maintenance from around £50,000 per annum at present to around £25,000 per annum on completion. This will be delivered through lower maintenance costs and more reliable equipment.
48. This proposal will also address an outstanding and growing problem, namely the age and condition of much of York's traffic signal infrastructure. If this proposal is not taken forward, then this problem will still exist and it will still be necessary to find funding to address this issue. This proposal, by addressing the problem in its entirety offers the most cost effective solution to it.

Human Resources (HR)

49. No HR implications anticipated

Equalities

50. Many of York's traffic signal installations have been in place for many years, as demonstrated by them reaching end of life. This means that many of the more recently introduced standards intended to accommodate the needs of people with disabilities, such as tactile paving and rotating wait cones are not provided. This proposal will present an ideal opportunity to replace outdated sites with new equipment that meets the current accessibility standards.

Legal

51. There is a need to ensure relevant procurement law is followed in letting the contracts necessary for the delivery of these programmes.

Crime and Disorder

52. No Crime and Disorder implications anticipated

Information Technology (IT)

53. The implementation of new equipment at traffic signal sites will facilitate the further roll out of communications based on the Council's private fibre network. Continuing this work, which has been undertaken at numerous traffic signal sites already, will see

more sites removed from costly BT provided communications solutions and migrated to the fibre network, saving additional revenue for the Council.

Property

54. No Property implications anticipated

Other

55. No other implications anticipated

Risk Management

56. *Risks associated with not adopting this proposal;*

Risk – That continuing rising revenue costs to the Council through maintaining an ageing asset;

Mitigation – This programme will ensure that all 'end of life' sites are replaced with new equipment with a much lower maintenance cost and risk.

Risk – That the Council will need to allocate increasing levels of new funding to renew traffic signal sites, as they continue to age;

Mitigation – this programme will deal with all end of life sites in the most cost effective way and remove the need to allocate funding on an ad-hoc basis to deal with specific issues.

Risk – The operation of traffic signal locations continues to deteriorate as detection problems worsen, causing increased delays on the network and reputational damage to the Council;

Mitigation – Undertake the wholesale replacement of exiting induction loop detectors with above ground detection as proposed.

Risk – That an ageing asset can lead to failures that effect public safety and can expose the Council to risks associated with Health and Safety and Construction Design and Maintenance legislation;

Mitigation – Replacement of ageing assets limits the likelihood of incidents affecting public safety. Assessing and acknowledging the problems we have with ageing assets and putting in place measures to address this mitigates the risks under Health and Safety and Construction Design and Maintenance legislation.

Risks associated with adopting this proposal

Risk – Ensuring cost effectiveness through an open and competitive bidding process;

Mitigation – the proposal has been designed in a way that will maximise the likelihood of suitable suppliers wanting to participate in the tender process.

Risk – The complexity of tendering a programme such as this;

Mitigation – the tender process will be overseen by the Council's Procurement Team and will follow EU procurement practice and legislation.

Risk – That construction of the new signal installations will adversely affect the road network;

Mitigation – The contract will fully address the performance expected of the contractor when working on site and colleagues from the Streetworks Teams will be fully involved in planning any works on the highway.

Risk – That the newly designed junctions will not operate effectively;

Mitigation – the Council undertake a design checking role, resourced as part of this project. The delivery of the programme will be managed by the Transport Systems Team, in which the expertise in operation and management of the City's traffic signals systems lies.

Contact Details

Author:

Darren Capes
Transport Systems Manager
City and Environment
Services,
Transport Group
Tel No: 551651

Chief Officer Responsible for the report:

Neil Ferris
Acting Director of City and Environment
Services

**Report
Approved**

Date 28/10/2015

Specialist Implications Officer(s)

Wards Affected: *List wards or tick box to indicate all*

All

For further information please contact the author of the report

Background Papers:

Annexes - None