



Doncaster Council

Report

Date: 26th July, 2018

**To the Chair and Members of the
AUDIT COMMITTEE**

STREET LIGHTING PROJECT – AUDIT REPORT

EXECUTIVE SUMMARY

1. This report represents the results of an audit review of the SMART Lights project undertaken by the Street Lighting Team, part of the Highways and Street Lighting service within Regeneration and Environment.
2. This work was undertaken in 2 distinct parts. An initial review regarding concerns of the over-ordering of stocks and missing lamps and a second element whereby the whole project was reviewed after further concerns were raised about continued issues and a lack of overall clarity on figures being reported to them.
3. A copy of the report regarding both elements is attached to this covering report and concludes that whilst the SMART Light project was / is beneficial and does save the Council money in terms of ongoing energy cost reduction, issues with the management of the project and on the ground project delivery caused significant losses in terms of over-ordered stocks of component LED lamps. This does not negate the overall value of the project, but did mean that a potential loss of over £700k occurred that could have been avoided should the project have been better managed through the over-ordering of 3,743 lamps. (It should be noted that 1,419 of these are not yet paid for and remain with the supplier. These were ordered but have not yet been paid for and negotiations regarding these are ongoing with the

supplier. It should also be noted that this is the current position re these stocks and these figures do continue to change as final elements within the scheme are finished).

4. Options to recover these monies and use these additional stocks are being considered and should be firmed up by the end of August 2018. These include negotiations with the supplier to take back some of the stocks ordered, options to convert stocks for use in other lighting schemes and sales of the stocks for use in the schemes of other authorities. As a result, the losses identified above are not final values. As these options are still being considered and are yet to be agreed, no detailed plan is available for inclusion in this report.
5. Issues noted through the project (in summary) include:
 - 5.1. The over-ordering of lamp stocks;
 - 5.2. Additional costs spent converting lamps from one type to another because they were not the part that was needed (this at least meant that additional stocks were not ordered but was an additional and unnecessary cost to the Council). The level of these costs is not currently quantified.
 - 5.3. Poor project planning with no use of PRINCE 2 techniques or other similar project management techniques.
 - 5.4. A Project Board and Project Team to govern the project were in place to challenge the project and hold it to account but were hampered by a lack of documentation regarding any challenge and actions taken and by the delayed sending of project figures with these being regularly tabled at the meetings rather than circulated in advance for comment and analysis.
 - 5.5. Poor data quality as the actual number and locations of lighting columns was not properly known before the project commenced (the column inventory was out of date and inadequate to commence the project. It was not updated before the project commenced). This was due to the pressure to actually commence the project and achieve the savings outlined.

- 5.6. The ordering of lamps of distinct sub-types before the schemes were designed, therefore, before the actual requirements were known.
 - 5.7. Poor ordering and stock control procedures in the early stages of the project.
 - 5.8. Insufficient resource dedicated to the scheme design and back office recording of the work undertaken with a disproportionate number of teams (in comparison) working on lamp installation.
6. Further details on all of the above are included in Appendix A that accompanies this report.

EXEMPT REPORT

7. This report is not exempt.

RECOMMENDATIONS

8. The Audit Committee is asked to note the contents of the report and action taken as a result.

WHAT DOES THIS MEAN FOR THE CITIZENS OF DONCASTER?

9. The new SMART Light scheme ensures that street lighting levels have been maintained across the borough and that ongoing yearly energy costs have reduced significantly as a direct result of the implementation of these new and more efficient LED street lights.
10. Financial losses as a result of the over-ordering of lamp stocks reduce the amount of monies overall available to the Council. However, options are being pursued to liquidate some of these stocks in order to minimise any overall financial impact. As these options are still being explored, this report is unable to give a final value for consideration and is unable to give detailed plans on these arrangements as these are still (at the time of this report) being finalised.

BACKGROUND

11. Doncaster Council's SMART Light project is a scheme to modernise Doncaster's residential street lighting stock. The Project was been split into 2 phases: Phase 1 was lighting for mainly residential streets and Phase 2 for main routes.
12. A tender exercise was conducted in May 2015 to procure a supply of new LED lamps to the Council for use in the scheme. The LED lamps are more energy efficient and cheaper to run for the Council as they have an expected life of 100,000 hours (around 25 years of normal usage), whereas the Council's original lights only lasted up to 6 years before they need to be replaced. As well as making savings, the scheme was designed to reduce the Council's carbon footprint.
13. The new lights use a computer management system (CMS Planet) that shows the status of each of the active lights on the grid. This enables the Council to identify faults automatically, sometimes before the light actually fails, so residents will experience a reduced need to report faulty streetlights to the Council.
14. Each light requires a Telecell, which sends a signal to a base station, which then relays it to the central system at North Bridge. This allows remote control of the lighting levels and monitoring of the lights for faults.
15. The Council invested apx £13.3m to date on the new technology (please note that this is not yet finished), which is mostly funded by an environmental loan from a company called SALIX. The Council will save at least £1.4m per year compared to the running cost of the previous lights.
16. The SMART Light project was set to take place over 2 distinct phases with phase 1 installing approximately 33,000 lamps in residential areas and phase 2 dealing with approximately 14,000 lamps in main road areas. Both phase 1 and phase 2 of this project are complete (with the exception of some sporadic lamps) and the project is currently moving on to the procurement and installation of smaller numbers of decorative lanterns, high mast and zebra crossing lamps.

OPTIONS CONSIDERED

17. None.

REASONS FOR RECOMMENDED OPTION

18. .None

IMPACT ON THE COUNCIL'S KEY OUTCOMES

| Outcomes | Implications |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Doncaster Working: Our vision is for more people to be able to pursue their ambitions through work that gives them and Doncaster a brighter and prosperous future; <ul style="list-style-type: none">• Better access to good fulfilling work• Doncaster businesses are supported to flourish• Inward Investment | None |
| Doncaster Living: Our vision is for Doncaster's people to live in a borough that is vibrant and full of opportunity, where people enjoy spending time; <ul style="list-style-type: none">• The town centres are the beating heart of Doncaster• More people can live in a good quality, affordable home• Healthy and Vibrant Communities through Physical Activity and Sport• Everyone takes responsibility for keeping Doncaster Clean• Building on our cultural, artistic and sporting heritage | None |
| Doncaster Learning: Our vision is for learning that prepares all children, young people and adults for a life that is fulfilling; <ul style="list-style-type: none">• Every child has life-changing learning experiences within and beyond school• Many more great teachers work in Doncaster Schools that are good or better• Learning in Doncaster prepares young | None |

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| people for the world of work. | |
| <p>Doncaster Caring: Our vision is for a borough that cares together for its most vulnerable residents;</p> <ul style="list-style-type: none"> • Children have the best start in life • Vulnerable families and individuals have support from someone they trust • Older people can live well and independently in their own homes | None |
| <p>Connected Council:</p> <ul style="list-style-type: none"> • A modern, efficient and flexible workforce; • Modern, accessible customer interactions; • Operating within our resources and delivering value for money; • A co-ordinated, whole person, whole life focus on the needs and aspirations of residents; • Building community resilience and self-reliance by connecting community assets and strengths; • Working with our partners and residents to provide effective leadership and governance. | <p>The SMART Lights project has delivered significant savings for the Council and will continue to do so on a yearly basis. (This is in terms of energy usage costs of the new LED energy efficient lamps compared to the older sodium lamps).</p> <p>However, there are value for money implications associated with this report and the potential losses caused by over-ordering.</p> |

RISKS AND ASSUMPTIONS

19. At this stage of the SMART Lights project, options regarding the over-ordered stock are still being explored. At this stage, the Council faces a maximum potential loss of over £700k on this project, but has assumed £350k in the 18/19 Budget monitoring position. The total value of any loss will not be known until these options have been explored and a plan to deal with the excesses finalised.
20. The 1,419 lamps ordered that remain with the supplier have not yet been accepted or paid for, however, this report makes the worst case assumption that these will need to be accepted and paid for. This may not be the case. The risk levels quoted

above include these 1,419 lamps. This worst case assumption is made throughout this report.

LEGAL IMPLICATIONS [Officer Initials SRFs..... Date 9/7/18.....]

21. There are no specific legal implications arising out of this report. Continued legal advice will be required in relation to decisions taken around the excess lamp stock, whether that be in relation to onward sales or discussions with the supplier.

FINANCIAL IMPLICATIONS [Officer Initials MS Date 10 July 2018]

22. As stated above the over-ordering has led to additional costs to the Council of up to £700k. A recovery plan is being prepared to outline how this loss can be mitigated through use of existing stocks for new developments, on-going repairs and the sale of any remaining surplus. £350k assumed loss has been assumed in the Q1 budget position and will be charged to Regeneration & Environment's revenue budget in 2018/19.
23. The project has made savings of £1.4m to date with more savings expected from further reductions in energy costs and a review of all street lighting revenue budgets.

HUMAN RESOURCES IMPLICATIONS [Officer Initials...MLV...Date.....08/07/18.]

24. The issues highlighted by the audit investigation detailed in this report warrant further consideration in relation to the conduct and action of the relevant officers in line with the council's Disciplinary Policy and Procedure and the Managing Employee Performance Policy to determine whether formal action is required under either policy.
25. Consideration should also be given as to whether there are any training and development needs for any of the officers involved in the Street lighting project to prevent any repetition of the issues highlighted through Audit's investigation.

TECHNOLOGY IMPLICATIONS [Officer Initials PW..... Date 09/07/18.....]

26. There are no specific technology implications in relation to this report. The purchase and implementation of a Central Management System (CMS) for the SMART Lights Project, supported by an appropriate asset management solution was considered

and agreed by the ICT Governance Board (IGB) in August 14. As a result of integration issues between Symology and the Telensa Planet CMS system it was subsequently agreed by the project team in November 14 to procure the externally hosted Mayrise Street Lighting Asset Management solution from Yotta, via CPR waiver.

HEALTH IMPLICATIONS [Officer Initials: KH Date: 9.7.18]

27. The energy efficiency gained by updating the lighting will have wider benefits for the environment.
28. Although artificial light can provide many benefits to society, for example extending the time people can spend outside recreationally and providing better visibility in public spaces, it is important that the right lighting is in the right place, at the right time.
29. In Section 4 of the summary, the possibility of converting/re purposing excess stocks for other lighting schemes is considered. There are health implications related to using inappropriate lighting in public spaces, including risks relating to glare, light pollution, harm to local ecologies and inappropriate light spectrums. In order to prevent the lighting impacting on health and wellbeing we recommend that the repurposing is only undertaken where the lighting type is correct for the purpose and poses no health, wellbeing or safety risks.

EQUALITY IMPLICATIONS [Officer Initials...NFW..... Date...06/07/18.]

30. None

CONSULTATION

31. None

BACKGROUND PAPERS

32. Attached to this report is the SMART Light Audit Report that gives further detail on the issues highlighted in this covering report. This is included as Appendix A.

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APPENDIX A

Internal Audit Report **Street Lighting –** **SMART Light Project**

Introduction

1. This report represents the results of an audit review of the SMART Light project undertaken by the Street Lighting Team, part of the Highways and Street Lighting service within Regeneration and Environment. These reviews were originally commissioned after concerns were raised by the Project Board regarding the management of the scheme, specifically with regard to potential losses to the Council as a result of over-ordering stock and concerns over missing lamps.
2. A review was commissioned at that time (May 2017) to review the stock ordering and control arrangements to determine whether the concerns over the ordering of stock and stock levels were justified and the financial costs of any associated over-ordering or lamp losses.
3. After the initial phase 1 report, lessons were identified for the continuation of the project into the phase 2 stage of the SMART Light project. Issues however, over progress reporting and ordering were again experienced (this time on a smaller scale), with identified data quality issues. This resulted in Internal Audit being asked to come back in and review phase 2 of the project to determine what was actually happening on the ground and the actual progress of the project.
4. As a result, the phase 2 audit review scope was significantly wider (beyond that of stock control) and looked at the wider project as a whole, the administration of the project (beyond ordering and stock management) and included the management of the project at both project and board level.
5. This report contains an overall summary of the issues from both audit phases along with details of the options being pursued to reduce the level of lantern stocks held.

Executive summary

6. Overall the SMART Light project was a worthwhile project that will (and does) save the Council money in terms of ongoing energy cost reductions, reduced levels of stock holding (in terms of less types of lamps to be held in stock and therefore the associated financial cost), and reduced customer interactions due to the fact that the CMS system detects faults within lamps thereby reducing the need for citizens to report outages. The purpose of the project was sound but the actual delivery of the

project was marred and this unfortunately detracts from the overall success of the project. This project was delivered overall under budget £2.75m (estimated over the 2 phases).

7. The project was not properly thought through before delivery of it began (in terms of project management, data quality and the systems required) and the majority of the issues with this project can effectively be traced back to a lack of properly controlled project planning and project management with the completion of the installation of new lamps being the primary concern for the project with too little emphasis on the quality and control of the project and its data. This is explained in the main report that follows.
8. Detailed issues are included in the 2 “Detailed analysis” sections of this report that follow this main report, however, headline issues include:
 - 8.1. The over-ordering of stock with some 3,743 additional lamps still in stock as at March 2018 at a cost of over £700k. (Please note that this figure differs from the cumulative total in the 2 detailed analysis sections. This is because some of the phase 1 surplus stocks were converted for use in phase 2 installations at a cost to the authority and others have been used in new capital schemes).
 - 8.2. Of the above units 1,419 are in the suppliers holding depot having been ordered but not taken receipt of. Whilst these have not yet been paid for, these were ordered by us and manufactured at our request. Discussions are ongoing with the supplier about taking back these stocks but the supplier would be within their rights to insist that these are taken and paid for, hence their inclusion in the above costings. (It should be noted, that this is not a final figure. There may be some warranty replacements that will offset some of this number, however, this is unlikely to be significant).
 - 8.3. Additional costs spent converting lamps from one type (where possible) to another because they were not the part that was needed (this at least meant that additional stocks were not ordered and existing stocks converted where possible, but this was an additional and unnecessary cost

to the Council). The level of these costs is not currently quantified but conversion costs are approximately £17-19 per unit.

- 8.4. Project planning was poor with no use of PRINCE 2 techniques or other similar project management techniques employed.
- 8.5. The Project Board and Project Team to govern the project were in place to challenge the project and hold it to account but were hampered by a lack of documentation regarding any challenge delivered. Actions taken as a result of this challenge were not clearly documented or signed off and update reports from Street Lighting (including progress figures) were tabled at these meetings rather than in advance (limiting their ability to scrutinise these reports in full. Whilst this governance structure did flag up the project for a review, this could have been escalated sooner.
- 8.6. The project was started without appropriate systems in place to deliver it effectively with new systems to record data being introduced after the project had started. This was the Mayrise system that was introduced to replace manual paper based systems because the existing technology could not handle an interface with the new SMART Lights system CMS Planet. The use of Mayrise was identified as a need before the project started but due to project delays this was not available in a timely manner.
- 8.7. Data quality on which the project was based (namely the inventory of street lighting columns), was woefully inadequate and out of date containing information about columns that did not exist. No attempt was made to correct or validate this inventory prior to the starting of this project and this essentially meant that those attempting to administer the project on the ground were constantly attempting to play catch up and correct data as they progressed.
- 8.8. Designs however, were based on operatives' walkthroughs and the documenting of lighting columns and assets in the area, however, orders for the lamps required were placed in phase 1 before schemes / streets had been designed and, therefore, before the product mix needed was actually known.

- 8.9. Ordering and stock control procedures in phase 1 of the project were poor with additional orders being made rather than existing orders being amended to reflect the actual mix of lamps required. This directly led to the over-ordering of lamp stocks.
- 8.10. Throughout the project insufficient resource was dedicated to the design and back office documenting of the project and light installations with a focus predominantly on installing as many lights as possible. The 7-10 installation teams working on the project outstripped the capacity of the office and design staff and this led to errors and delays in error correction and the build-up of errors to be investigated and resolved until the very end of the project.
- 8.11. Lessons learned from the audit of phase 1 of the project were generally learned and stock controls improved for phase 2 of the project but lessons regarding only ordering stocks once a scheme had been designed were not applied and further over ordering did occur on phase 2 with 573 unnecessary units being purchased at a cost of over £135k. (NB these 573 are included within those listed above and are not in addition to these). Stocks were again ordered in advance of designs based on estimates rather than actual requirements.

Dealing with the excess stocks

9. Discussions re a “recovery plan” to deal with the excess stocks are still in progress as at the date of this report and are due to be fixed by the end of August 2018. Some (110) of these excess lamps can be converted to work as zebra crossing lamps and used to replace some of the 268 zebra lanterns that are yet to be replaced.
10. Discussions are taking place in July (and should be complete by the time of this Audit Committee) with the supplier Urbis to determine the position of the 1,419 ordered items that have been produced and remain with the supplier (at this time, these remain unpaid for).

11. Minimal stock levels will need to be maintained for each of the 9 lamp types to cover errors, breakages, accidents and replacements as is normal on any street lighting scheme. Options re the remaining stocks include selling these on, using these on capital works schemes / commercial street lighting work and are being considered to reduce any overall financial loss to the Council.
12. A further update to the position on the recovery plan should be available for verbal update at the Audit Committee.

Moving forwards

13. Whilst there have been substantial errors within this project, the overall value of the scheme remains positive. Additional work on the new SMART Lights is continuing and the Street Lighting Team is passing on lessons learned from the Doncaster experience to other authorities embarking on similar projects.
14. The scheme designs are being imported into the CMS Planet (the SMART Light monitoring system) to ensure that the correct lanterns (according to the designs that were done) have actually been put in place. Errors in this would have been identified by the reconciliations between systems but these proved too problematic at the time. This risk however, has not been ignored and these alternative measures are being put in place to make sure the lamp fitted is in line with the design.
15. Barcode scanning is being looked at and developed in conjunction with ICT in order to scan in the lamp barcode for automatic entry into the back end systems thereby minimising any future issues within CMS Planet by ensuring that the information that the system is provided with is accurate and verified, avoiding costly re-inspection and rework.

Detailed analysis – SMART Lights Phase 1 – Procurement, ordering and stock control

16. The purpose of the review on the phase 1 project, was to determine whether there was (and if so the extent of), any over-ordering of LED lamps that had taken place and quantify (both in absolute and financial terms) any over-ordering that had taken place and the extent of any missing lamp stocks. This scope was agreed with the Assistant Director for Environment prior to the start of the review.
17. The remainder of this analysis has been split on a subject matter basis and is in summary form, highlighting the weaknesses identified by the review in each of the stated areas.
18. Lessons learned from the review of the phase 1 process have also been included. These are again summary versions of the detailed lessons learned that were communicated to all relevant parties at the end of this initial review.

Procurement and ordering

19. The procurement process for the phase 1 lamps was concluded before the individual street designs were completed, therefore, before the actual numbers and types of lamps required were actually known. The number of lamps estimated for the procurement was based on information from the lighting column inventory, which was badly out of date and contained significant numbers of errors (missing columns, columns listed that no longer existed in those places etc).
20. The procurement was undertaken using 2 types of lantern known as type A and type B and an approximate mix of the 2 types. However, when the designs were completed, these used a mixture of type A, B, and 2 designs not on the original procurement, types C and D. These additional lamp types were required to address lighting difficulties in streets where the street was curved or a cul-de-sac as lighting levels using the originally identified types were not suitable. This was not known until the design phase had started and the first trial area in Thorne and Moorends had been installed.

21. The first orders of lamps were also placed before the designs were completed without knowing the mix of lamps required for the project. An initial order was placed in September 2015 for all of the estimated 33,000 lanterns that were estimated as needed for the phase 1 project with the belief that this would need to be adjusted as the project progressed and the actual mix of lamps required became known. This decision to complete the contract without completing the design was made in order to ensure that SALIX Loan was secured. However, it is clear that the ordering of incorrect lamps would have been less likely to occur if the scheme design had been properly known before the procurement was undertaken, or at least before orders were placed, as more accurate information about the types and quantities to order would have been known.
22. Roles and responsibilities were unclear within the ordering and stock control elements from the outset. Contact with the supplier Urbis was made through the Stores Team as well as the Street Lighting Team and these communications did not always include all relevant parties, leading to a situation where not all parties were always aware of what discussions had taken place with the supplier or what had been agreed. The role of the Stores Team was to ensure orders were placed as the Street Lighting Team informed them of the requirements (as the designs were agreed). There was no one key Council contact for the contract with both the Stores and Street Lighting team making amendments and querying orders and deliveries which blurred the lines of communication.

Pricing of the supply contract

23. The price agreed for the lamps following the procurement exercise was £149.33 per lamp. This was for an Ampera Mini 16LED lamp, but the procurement exercise did not specify any variations to this (i.e. to accommodate the different types that might be needed). This was because the need for lamp variations was only noted AFTER the procurement exercise had been completed. As a result, the price of the alternative lamps was not compared to that of competitors during the procurement and it is not known whether this would have changed the result of the procurement exercise.

24. In addition to the above, there have been variations in the prices paid during the project. The price of Type A lamps (the Ampera Mini 16 LED lamp included in the tender specification) was consistent with the procurement contract throughout the period. The price charged for Type B lamps was marginally lower than the contracted price. The price charged for Type Cs and for type Ds however, varied across the period of the phase 1 project. Ideally, these prices should have been fixed by the contract for the supply period. These changes in price were not challenged by Stores staff ordering and receipting these goods as they were not included within the procurement documentation and, therefore, Stores paid the price charged by Urbis at the time of the order. Whilst it is not definitive (there are no crystal balls with respect to what would have happened), it is likely that better prices would have been available if the costs for these types had been fixed by the procurement exercise.

Ordering Procedures

25. It was believed by the then SMART Light Manager, that the order placed with Urbis Schrider (the supplier) was a call off order for an overall number of lamps and that sub-orders would be called off from this 33,000 in the correct mixes required. This type of order is commonly used for such orders and removes the need to raise and authorise all individual orders at lower level.

26. Once the scheme designs had commenced in October 2015, a need for C and D type lanterns was also identified (the designer only commenced in post in August 2015). A modification to the original order was requested by the Street Lighting Team via the sending of a new schedule of stock requirements. This schedule was maintained and shared by the Design Team with the Stores Team on a regular basis. (Essentially the stock requirements were altered from As and Bs to A, B C and Ds and this schedule was updated on a monthly basis). The Street Lighting Team believed any requests for lamps A to D given to the Stores Team through this schedule would be accommodated out of the original order (e.g called off from the bulk order created) and that these were not additional to the original order. As a consequence of this, the Street Lighting Team therefore believed that the breakdown on the original order of 33,000 units should have been changed by the Stores Team to accommodate the different types now known to be required. However, due to the confusion, additional orders were actually placed by the Stores Team for more B's

and for C and D type lamps rather than the call off order being amended to the new mix required. This resulted in orders for 10,800 additional units being placed in addition to the original order of 33,000.

27. Orders and the stocks received were never reconciled to the design requirements. Additional orders raised by Stores were not seen by Street Lighting. This lack of reconciliation essentially meant that the higher number of orders and continued receipt of lamp stocks was not noticed till stock levels were already higher than needed.

28. The following orders and deliveries were received for phase 1 of the project

| Lamp Type | Ordered | Received |
|--------------|---------------|---------------|
| A | 31,500 | 21,177 |
| B | 2,550 | 3,823 |
| C | 2,700 | 2,700 |
| D | 7,050 | 8,152 |
| Total | 43,800 | 35,852 |

29. In addition to the above, a further 1,419 lamps were produced by Urbis on the orders raised but remain with Urbis and remain unpaid for. However, negotiations have been ongoing throughout to attempt to get the supplier to “sell on” some of these stocks and negate the order despite these being manufactured at our request. These negotiations remain in progress.

30. As at the 21st of September (the date of the Phase 1 SMART Light report), there were excess stocks for the phase 1 programme of 4,316 units at a cost of £640k. (A breakdown of these stocks is not provided in this report. Later figures from 01/03/18 are used later in this report that combine the over-ordering of stock from both phase 1 and phase 2 and details are provided in this table instead). These show a reduced loss from the phase 1 programme as some of these stocks were eventually used on new scheme works and some were converted (at a small cost) to other lamp types for use on the phase 2 project. This has reduced the overall loss from this phase.

Stock Control

31. Orders delivered and received were booked into (at that time) the TASK system by the Stores staff. This has the effect of adding them to the stock levels within stores so that they can be issued as appropriate for jobs.
32. The Street Lighting Team would inform stores what the lamp requirements were for the project on an ongoing basis, and operatives were given their work schedules to match this. Operatives would visit stores and request the relevant numbers and types of lamps to be fitted as per their schedule. These would be issued by the Stores team, booking the items out of stock and charging the items to the job number given to them by the operatives. Any excess stock not used would / should be returned to stores and rebooked into stock for re-issue at a later date. However, this process was not followed by the Street Lighting team who instead had stored some of these items under an arch within the main depot. Additional items that were faulty and due for return to the supplier were also found outside of Northbridge Stores.
33. There was no clear auditable system used for the return and storage of faulty lamps to the supplier. Faulty lamps are covered by a warranty issued by the supplier Urbis. As such, they needed to be returned to Urbis who in turn would issue a replacement part. Whilst assertions were made that staff within the installation teams were informed to return faulty items to stores, this was not the process always followed in practice. Instead some of the faulty items were stored within 'the arches' at North Bridge Depot and not returned to the main Stores for return to the supplier.
34. Stores staff were responsible for returning faulty parts to Urbis for replacement. There were no clear records kept of any replacements received for faulty items or any sent back to the supplier. Any returns did not go through the TASK system and therefore a clear audit trail is not available to ensure that those sent back to Urbis were actually replaced. Instead stores operatives would email Urbis to inform them how many of each type of lamp needed to be returned and they would make arrangements for collection and the replacement. It is not clear whether all of these replacements were actually received or not. However, by not using the stores TASK system to book back into stock any damaged or faulty goods, 2 lamps were then recorded by the system as being issued for 1 lighting column. This had the effect of

suggesting that there were in fact significant numbers of lanterns missing when in fact the actual variance between stocks and usage was minimal.

Future focus – Lessons learned from the phase 1 project

35. At the conclusion of the phase 1 review, a “lessons learned” section was included and returned to all of the parties involved with the review. This was released in August 2017 with a final agreed version being issued in September 2017. These recommendations were, however, discussed throughout the review with those involved in the project. The following recommendations were made from the phase 1 review:

- 35.1. Orders and deliveries should not have been placed until the design for the scheme was completed to ensure that they were based on actual requirements avoiding the confusion caused by constantly changing product mixes;
- 35.2. Communication lines needed to be clearer between all parties with the requirements of the project (whilst it was running) clearly discussed by all parties involved in the process rather than being communicated by email / an order schedule that could be misinterpreted;
- 35.3. There should have been a single point of contact between the Council and the supplier Urbis with a clear record of communications with the supplier;
- 35.4. Roles and responsibilities for those involved in the project should have been clearly defined;
- 35.5. Regular reconciliations should have been undertaken to ensure that orders placed matched the scheme design and that orders are appropriate and matched the overall contract. Monitoring should take place against these reconciliations with the results discussed at project monitoring meetings to ensure orders are appropriate and identify any mistakes or issues early on in the process; and
- 35.6. Clear process should be established by the Stores team for faulty items with these re-communicated to all staff for them to follow with any faulty items returned to the supplier being clearly recorded within the stores system for monitoring purposes.

36. Further recommendations were also made regarding dealing with the surplus stocks with recommendations made to explore options regarding the disposal / use of surplus lamp stocks. These have not been covered here as the current plan to use up these stocks is included within the main body of this report.

Detailed analysis - phase 2 audit review

37. In November 2017, a further call was received from the SMART Lights Project Board concerning further issues with the SMART Light project. Concerns were raised that the numbers of columns requiring installation were fluctuating constantly suggesting that there were no clear records concerning the number of lanterns that were actually needed. At this point a further review was commissioned to look at the whole process to determine the cause and extent of any issues with the project. The scope of this work was agreed with the SMART Light Project Board prior to commencement.
38. The commissioned review, found that the majority of the learning from the phase 1 review had taken place, but not all. There were no issues noted with the operation of the stores function or in the contact with Urbis. However, over-ordering had continued into phase 2 (except on a smaller scale with over –ordering occurring from September 2017).
39. Significant issues were again uncovered by this second review. These have again been organised by theme and appear below.

Scheme design and installation

40. Asset information (essentially the street lighting column inventory) was outdated and contained a significant number of errors in terms of the location and even the existence of some of the lighting columns within it. This information was originally used to as the basis for the procurement tender estimations for phase 1 and phase 2 (33,000 and 14,000 lamps respectively).
41. In order to design the schemes properly, operatives walked the streets to map current column locations, road widths and assess lighting requirements for their

inclusion into the designs created. Whilst this was time consuming, reliance on the asset inventory would not have been possible. However, this then led to significant variations and movements on the number lamps left to install as this was originally based on the inventory figures and was constantly revised as the designs were completed and actual numbers of columns in an area became known. Essentially, the actual number of columns was not known until all assessments and designs had been completed. This was the main cause of the variations in the number of columns still to design/ fit which was raised as a concern by the Project Board.

42. Designs for phase 2 of the project used lamp types E, F, G and H, again these were not part of the original procurement exercise but were instead legitimately procured through the ESPO procurement framework. Their use was legitimate as higher power lamps are needed for main road areas.
43. There were 7 Doncaster Council teams installing SMART Lights with an additional 3 subcontractor teams drafted in to assist to speed up the project. An average of 1600 lamp fittings were taking place per month with the teams using new handheld equipment to log their installations and locations rather than paper based recording mechanisms.
44. Designs initially fitted to the Thorne and Moorends area (the first area fitted on phase 1) were flawed. Attempts had been made to match existing lighting levels in any area where the lamps were replaced and the process used was that advised by the manufacturer. However, this did not provide reliable results and when the area was completed this attracted significant complaints and was redesigned. As a direct result, specific design software (Lighting Reality) was purchased in order to model the designs and achieve a better result. However, this made the design process significantly more time consuming and making it significantly more difficult for the design process to keep up with the 7-10 teams fitting lamps across the borough. This essentially meant that some of the checking processes that were scheduled to take place after fitting were left to the end of the project in order to keep up with the pace of fitting across the project (by directing the checking resource to the designs instead).

45. In hindsight, a slower approach with error checking throughout would have been more beneficial but this would have delayed the savings from switching to the newer LED lamps. The continued use of subcontractors in addition to Council teams (once the new but slower design process was implemented) again added additional and unnecessary pressure to the process with the project concentrating essentially on throughput (numbers installed) rather than the quality and accountability of the project.
46. In addition to the above, throughout the project (phase 1 included), where an existing older type lamp (the orange ones) failed, a decision was taken to put up a new LED lamp rather than leave a failed light in place. Operatives replacing the unit did so using what they believed to be a suitable LED lamp alternative based on information that they had been given from the design teams. This was a sensible solution. However, as the fitting for these lamps was done before the design was completed there were invariably some lamps installed of an incorrect design that should have been changed as the rest of the lights in an area were fitted to the new design. This was not always done and these columns were not always noted for changing resulting in errors at the end of the scheme.
47. Whilst the designs were done in a specialist design program, the records of the designs for action were kept in spreadsheets. These were copied and passed to other members of staff in order to order the correct products and raise a job for each individual light to be fitted. However, as with any such manual process this was prone to errors. Changes to the spreadsheet (and therefore changes in any designs) were not noted (there is no audit trail on a spreadsheet and therefore no way to know that anything had been redesigned except where it was specifically highlighted or communicated outside of the spreadsheet). As a result, some changes were not noted or actioned and duplication in designs (for example the same column showing 2 different designs in 2 separate parts of the spreadsheet) were not noted resulting in some double counting for statistical / ordering purposes. A more controlled change / design process or additional checking resources would have been needed to detect and prevent errors in such a manual system.

Stocks and ordering

48. It was pleasing to note that the stocks and stores issues from the phase 1 review were not present in the phase 2 project with stores and stock control functioning as would be expected. There were no missing items identified on the phase 2 review and no stock discrepancies beyond that expected in any manual stores process.
49. However, issues continued within the ordering process. One of the lessons learned from phase 1 was the need to order products when the design was completed. However, it is clear that this did not happen in reality. The SMART Light Project Manager reported to the board that orders were being placed only for designed items but examination of the reports to the Project Board showed that this was not actually the case.
50. The following is an extract of the orders and designs table from the September 2017 Highlight Report.

| Data Correct at 29/08/2017 | Lanterns Already delivered/ Ordered | Lanterns Designed | Required on Next Delivery | Recommended Next Delivery |
|-------------------------------|----------------------------------------------|----------------------|------------------------------|------------------------------|
| Type E Ampera Midi | 2725 | 2644 | -81 | 150 |
| Type F Ampera Midi | 2955 | 2960 | 5 | 200 |
| Type G Ampera Midi | 2655 | 2796 | 141 | 350 |
| Type H Ampera Midi | 375 | 344 | -31 | 25 |

51. As can be seen, the number of lamps / lanterns in stock was already (for 2 of the required product lines), higher than the number designed but still more were being ordered for delivery (the end column). This again resulted in over ordering for the phase 2 project as (as it clear from the table above); orders were being placed in advance of the designs being completed. These were done on an estimated basis. There are contrasting recollections from those involved in the project and from the boards about the instruction to order only to design. There is little documentary evidence to show that this requirement was communicated and understood at operative level. However, this failure to order only with a completed design was the main direct cause of the over-ordering of additional lamps on the phase 2 project.
52. Over-ordering on the phase 2 project lines (types E,F,G and H lamps) however, was relatively low with a reported 573 over ordered lamps. Prices per lamp for these

types were £219 per lamp for types E, F and G and up to £310 for type H. This puts the spend on these over-ordered items (using an average price) for phase 2 products of over £135k. This loss is in addition to the loss on the phase 1 project.

Systems, data quality and error management

53. The systems required to undertake the project were not in place prior to its commencement. The asset inventory (the inventory of lighting columns) was incomplete, out of date and contained columns that did not exist. Setting off with poor quality information in the first place in our opinion, left the project constantly playing catch up.
54. Changes to the inventory were not made when noted as part of the walkthrough. This meant that throughout the project, it was impossible to know with accuracy how many of the columns were still to be designed and fitted. This metric was reliant on the use of spreadsheets maintained manually which, as already discussed contained errors and were completed inconsistently by different members of staff. This was primarily due to the fact that for the majority of the project, back office support and design functions were significantly under resourced and were attempting to design and input manually to systems for 7 to 10 installation teams. Inevitably, this lead to increased error rates and delays in updating the asset inventory.
55. The system Mayrise was procured part way through phase 1 and was procured just 2 months before onsite installations began with the delay being caused by procurement complications. Manual paper based systems are error prone and a decision was made relatively early on in the project to look for a way to transfer information into the CMS Planet system (the system that controls the new LED lights and reports on them) to minimise manual errors. The Symology system in use within Street Lighting at that time was not suitable and instead the Mayrise system was procured and put into operation to address the shortcomings. This required a full transfer of all of the asset data (street lighting column assets) from one system to the other. A new system however, is prone to errors and user difficulties as they are not familiar with the system. Whilst this was introduced in time and did reduce the error rates, the methodology for completing the project needed to have been

considered and implemented at the project conceptualisation / planning stage and not once the project had started. Staff were still becoming familiar with the new system during the first weeks of installation and this will have increase the amount of errors within the system.

56. Attempts were made to reconcile the data between the design spreadsheets, the CMS Planet system and Mayrise but these were unfruitful with significant error rates between the systems. This work was further hampered by a systems migration that took place with a live implementation date of 31st March, 2018 and the work required in order to make this happen. Instead a decision was taken to complete all works and manually review and deal with all errors. Essentially this means that there is a small chance that some installations have been missed as such a reconciliation would have identified columns that may not have been re-fitted. However, this is a relatively small risk and is being mitigated by inspections / error checking and manual reviews by the Street Lighting team.
57. At the outset of the project, checking was proposed to take place throughout the project to detect and address any errors. This resource however was quickly lost and re-directed to scheme design due to the delays being experienced there. The CMS Planet system controlling the lights has inbuilt error reporting that identifies faults with the lights. These are now being worked through with many of the errors having been resolved in the last 2-3 months. Errors occur for a number of reasons, some caused by errors within the installation, others caused by programming issues and others by faulty lamps or connections. A checking resource however, throughout the project would have minimised the build-up of these errors and provided feedback on the types of errors being detected so that these errors could have (where appropriate) been avoided throughout the rest of the project.

Project management

58. The governance structure for the project included a Project Board with overall responsibility for project progress and delivery within budget and timescales, and a Project Team to assess matters at a detailed project, financial and operational level.
59. Project management arrangements were examined through:

- Review of a sample of project board meetings records obtained from various team members;
- Review of information presented at a sample of project team meetings; and
- Discussions with Project Board and Project team members.

60. This work showed that there was a developed reporting structure used for updating the Project Board and this reporting structure incorporated some key aspects of the project, eg progress, costs, to some degree, and communications. However:

- The application of any established project management conventions (eg PRINCE) appears to have been limited in this project, which is surprising given its scale, value and (political) importance;
- Audit work undertaken shows weak project management and a disconnect between the project team and stores function, leading to errors made in stock ordering;
- We did not see any 'issues log' that would ordinarily record any issues raised by either the project team and/or project board and ensure these were tracked until resolved at relevant project meetings; Some comments / questions about stock ordering were evident from meeting notes, but without any issues log there was no clear record of any precise instructions from the project board or project team, in this instance about stock ordering issues;
- There has been poor document management – reports, agendas, minutes, were not readily available / collated when requested, and there was no single repository for these to be held in; and
- There was insufficient administration support for the project, leaving project officers to carry out certain administration tasks such as the co-ordination and distribution of meeting agenda papers.

61. Because of the significantly fluctuating figures provided by the project team in terms of the total number of lights and total numbers designed, the Project Board could not / did not have any confidence in the information provided. In these circumstances the Project Board ought to have been seeking to rely on work done at Project Team level on the accuracy of the data being provided and the implications arising from the data. However, the Project Team was unable effectively to carry out this role as information provided to it was often tabled at the project team meetings, not allowing sufficient advance scrutiny of the data and this adversely affected their ability to raise concerns at the earliest point possible.
62. It is not evident from records seen that, faced with this process, the Project Team took robust action to fully establish the accuracy and completeness of data being provided, or to understand the implications of the information provided. Nor is there any evidence of any clear delegation or direction from the Project Board to the Project Team to do this.
63. Meeting records show that questions were asked about fluctuating stock. When unsatisfactory answers were provided to questions raised, the Project Sponsor ultimately commissioned Internal Audit to reconcile the stock information available. It is possible that action could/should have been escalated earlier when unsatisfactory responses were received from the project team in response to questions raised.
64. Records of decisions taken / questions asked in project board and project team meetings were not always very clear – there is some evidence in minutes of project board meetings showing some questions asked, but in hindsight, it would have been better in the circumstances, if:
- specific questions asked were noted, and
 - subsequently actions taken were recorded against the questions and
 - these were signed off when suitable assurances had been obtained.