

<b>Committees:</b> Corporate Projects Board - For Decision Streets and Walkways Sub Committee – For Decision Projects Sub Committee - For Decision	<b>Dates:</b> <b>6 October 2021</b> <b>12 October 2021</b> <b>20 October 2021</b>
<b>Subject:</b> Street Lighting LED Project  <b>Unique Project Identifier:</b> 9685	<b>Gateway 6:</b> <b>Outcome Report</b> Regular
<b>Report of:</b> Director of the Built Environment <b>Report Author:</b> Giles Radford, Highways Manager, DBE	<b>For Decision</b>
<b>PUBLIC</b>	

### Summary

<b>1. Status update</b>	<b>Project Description:</b> The project has replaced all existing street lighting and functional units throughout the City with smart LED lighting, in line with the street lighting strategy, utilising an integrated control management system for dimming and control purposes.  <b>RAG Status:</b> Green (Green) <b>Risk Status:</b> Low (Medium) <b>Costed Risk Provision Utilised:</b> Not Applicable <b>Final Outturn Cost:</b> £4,252,000
<b>2. Next steps and requested decisions</b>	<b>Requested Decisions:</b> Note the contents of this report and authorise closure of the project, with any unused balances returned to the on-street parking account. To note, the project was delivered on time and to budget.
<b>3. Key conclusions</b>	The project has successfully provided new lighting infrastructure to the City of London, replacing end of life equipment to enable significant reductions in maintenance costs, energy usage and carbon emissions.  The project has also helped to deliver key aspects of the City's innovative Street Lighting Strategy. This includes the softening

	<p>of the 'look &amp; feel' of the City's night-time environment by using a range of warmer colour temperatures and adapting the level of lighting to the wider needs. This creates a more welcoming, safe and legible environment after dark for residents, workers and visitors, and to support the development of the night time economy.</p> <p>The City's street lighting now uses a mesh-based control management system (CMS) that allows for real-time changes of lighting levels to individual units, fault reporting and energy usage data. This in turn has removed bureaucracy in terms of analysing unmetered supplies and reduced the need for night-time scouting. This also allows light "profiles" to be used to adapt the level of lighting to the location's requirements.</p> <p>The project was heavily linked into the supply chain throughout thereby allowing the City to remain at the forefront of lantern and CMS technology. The project subsequently won two national awards at the 2019 Lux Awards for Client of Year and Control Product of the Year.</p>
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## **Main Report**

### **Design & Delivery Review**

<p><b>4. Design into delivery</b></p>	<p>Preliminary design options were recommended by in-house officers, in line with the City Lighting Strategy recommendations, before engaging with the supply chain. Evaluation allowed for a preferred supplier, who then worked with us on lantern design in conjunction with the CMS provider. As a result, the detailed design was conducted in-house and incorporated the initial proposals, with the final scheme retaining the design principles set out at Gateway 3/4.</p>
<p><b>5. Options appraisal</b></p>	<p>The successful outcome of the project suggests the correct option for procurement and project delivery was taken, working with the in-house client and design team, as well as excellent supplier engagement and the use of Riney to deliver the works, instead of a full OJEU tender process.</p>
<p><b>6. Procurement route</b></p>	<p>For this project, based on the volume of lighting units required the City Procurement team confirmed that it could be procured via the Riney term contract without having to use to a standalone EU tender.</p> <p>A scoping exercise was used whereby the City set out its requirements, such as lighting output, reliability, design aesthetics</p>

	<p>and full life costing, and Riney sourced and recommend suppliers that best fit those needs.</p> <p>In terms of CMS units, there were three main providers fully engaged in the market, working with lighting manufacturers to deliver integrated lighting units with control units fixed within them.</p> <p>A short tender was then run-in conjunction with City Procurement to select a CMS provider to work with the City and Riney to deliver the CMS solution with the chosen lighting unit supplier(s).</p>
<p><b>7. Skills base</b></p>	<p>The project was largely delivered using existing in-house resources. The project was led by the Highways team and the works were undertaken by the City's term highways contractor.</p>
<p><b>8. Stakeholders</b></p>	<p>Key internal stakeholders such as Public Realm, City Transportation, Planning, Pollution Control, Open Spaces and the City Police were involved via the City's cross-department Street Lighting Board, as well as through regular design &amp; progress meetings.</p> <p>Other stakeholders consisted of local occupiers who were engaged with on a local basis during the installation phase, bearing in mind the majority of the City's lanterns are fixed to buildings rather than on columns.</p> <p>Several meetings on site were organised with City Officers and Members to test the different options regarding light levels and colour temperature. During these tests, it was possible to dim levels up and down in real time and compare different colour temperature, which resulted in providing the best lighting outcomes to fit the City context.</p>

## Variation Review

<b>9. Assessment of project against key milestones</b>	<b>Task</b>	<b>Target Date</b>
	Gateway 5 Approval	July 2017
	Award Control Management System contract	July 2017
	Place lighting equipment orders	Aug 2017
	Lighting equipment delivery begins	Nov 2017
	Phased rollout of LED lanterns, nodes & mesh system begins	Jan 2018
	City-wide coverage established (the 'canopy')	April 2018
	Area by area phased rollout of LED lanterns & nodes	May 2018 – Dec 2020
	<p>The project was successful in keeping to these milestones despite the impact of Covid-19. After an initial shutdown of all works during the first lockdown last year, works restarted as soon as safe to do so, allowing substantial completion with all installations completed by the end of 2020, with snagging works finished by the end of March 2021.</p>	
<b>10. Assessment of project against Scope</b>	<p>The project successfully delivered against the criteria set out in previous Gateway reports. No significant changes to scope were required during the design or implementation stages; this can be attributed to coherent project governance, good, advanced planning and an ability to make key decisions collectively and decisively.</p>	
<b>11. Risks and issues</b>	<p>The majority of project risks were mitigated and did not materialise. Throughout the project there was some teething problems ranging from the supply of CMS nodes, some sub-contractor concerns and unpicking historic localised engineering problems. However, these were overcome through working in partnership with the supply chain and Riney to ensure we delivered the programme on time and to cost.</p> <p>Costed risk was not utilised during this project.</p>	
<b>12. Transition to BAU</b>	<p>The same team installing the project will maintain the asset in the future. As a result, it was within everyone's interest to get it right first</p>	

time. This helped to ensure we had a manageable asset for the future.

## Value Review

### 13. Budget

<i>Estimated (G5)</i>	Estimated cost (including nil costed risk): £ 4,200,000
<i>Outturn (G3/4) Cost</i>	Estimated cost (excluding risk): £ 4 Million

	<i>At Authority to Start work (G5)</i>	<i>Final Outturn Cost</i>
<i>Fees</i>	£ 0	£ 0
<i>Staff Costs</i>	£ 217,172	£ 217,172
<i>Works</i>	£ 550,000	£694,591
<i>Purchases (LED's, lanterns, CMS brackets, wiring fixture and fittings)</i>	£ 3,442,000	£ 3,297,409
<i>Other Capital Expend</i>	£ 0	£ 0
<i>Recharges</i>	£ 0	£ 0
<i>Other</i>	£ 42,828	£ 42,828
<i>Total</i>	£ 4,252,000	£ 4,252,000

You will note from the above table that the sums do not entirely align with the G5 estimates but the overall sum aligns to the given budget.

At the point of writing the report, the original figures were correct to the best of our knowledge. However, as soon as the project started to progress forward some elements changed.

1. The cost for the CMS node was foreseen to be under the Urban control CMS budget, but when these become integral within the lantern (security requirement) this meant the cost became part of the lantern (LED lighting units), rather than the Urban Control CMS line. Hence, the budget adjustment.
2. For the other elements of the CMS process for gateways and their associated works these have gone through the term contract.
3. Costs in terms of the install did increase but marginally in relation to the overall cost of the works due to unforeseen circumstances and/or additional tasks.

	<p>In summary, minor budget line adjustments were undertaken further to these changes that occurred once the project had commenced, yet the project was actively managed and tracked to ensure the budget came in on budget.</p>																				
<p><b>14. Investment</b></p>	<p>At Gateway 5 the following savings were identified for this project under invest to save:</p> <table border="1" data-bbox="502 510 1449 779"> <thead> <tr> <th>Description</th> <th>Current Cost (£k)</th> <th>Projected Cost (£k)</th> <th>Projected Saving (£k)</th> </tr> </thead> <tbody> <tr> <td>Street Lighting Energy</td> <td>525</td> <td>210</td> <td>315</td> </tr> <tr> <td>Street Lighting Maintenance &amp; Repairs*</td> <td>346</td> <td>150</td> <td>196</td> </tr> <tr> <td>Festive Lighting</td> <td>27</td> <td>27</td> <td>0</td> </tr> <tr> <td><b>TOTAL</b></td> <td><b>898</b></td> <td><b>387</b></td> <td><b>511</b></td> </tr> </tbody> </table> <p>Further to a service-based review and the last efficiency savings, the maintenance budget line is now £150K per year as profiled on the basis of the investment made through the project.</p> <p>In terms of energy, we have significantly exceeded our target for actual energy and carbon saving (see section 16). However, in terms of cashable financial savings, the energy market has seen significant increases in commodity and non-commodity charges since 2017, which has had a negative impact on the saving. The City’s energy contract, with a focus on procuring renewable electricity over “brown” conventional electricity supports the corporate objectives but incurs additional cost. The combined result has seen the cost of energy for street lighting almost double between 2017 and 2021, resulting in financial saving from energy costs being lower than predicted at £135K per annum rather than the projected £210k. Had the rate for electricity been the same now as it was at the start of this project it is estimated that a saving of approximately £400K per annum would have been achieved.</p> <p>However, as markets have risen, the reduction in energy consumption has reduced the risk of increased energy costs, which is more significant.</p> <p>Furthermore, this is expected to improve with the arrival of the power purchase agreement in 2022 and as we refine our real-time energy monitoring and assets whether further changes to the City’s lighting can be made in terms of trimming hours and reducing levels if appropriate to do so. However, suffice to say that if the project had not been implemented and delivered when it was, the financial impact of this tariff increase on Highway’s previous energy budgets would have been significant.</p>	Description	Current Cost (£k)	Projected Cost (£k)	Projected Saving (£k)	Street Lighting Energy	525	210	315	Street Lighting Maintenance & Repairs*	346	150	196	Festive Lighting	27	27	0	<b>TOTAL</b>	<b>898</b>	<b>387</b>	<b>511</b>
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<p><b>15. Assessment of project against SMART objectives</b></p>	<p>The project has been a great success in terms of being delivered on time and to budget, whilst making significant energy and carbon savings to support the City’s Climate Action Strategy.</p> <p>It has also achieved the relevant objectives from within the Street Lighting Strategy relating to delivering changes to lighting levels, temperatures and timings, as well as reducing the overall number of fixtures and fittings being used.</p>
<p><b>16. Key benefits realised</b></p>	<p>As noted above, the project has delivered street lighting infrastructure that can be better controlled, amended and managed, with proactive fault finding and energy reading for the future.</p> <p>The ability to raise &amp; lower lighting remotely has allowed us to work with the City Police to manage problem areas suffering from anti-social behaviour, and the use of more efficient lanterns have enabled us to reduce light spillage in areas of concern to the City’s Pollution Control team.</p> <p>Having different lighting profiles for different lanterns has enabled us to move away from a ‘one size fits all approach’ to lighting the Square Mile, and even allowed us to appropriately reduce lighting levels during Covid to match the reduction in pedestrian footfall.</p> <p>The project has provided a significant reduction in energy &amp; carbon usage, as well as maintenance costs. To date, the project has achieved:</p> <ul style="list-style-type: none"> <li>• 57% saving (2.9 million KWh) in energy pa</li> <li>• 78% saving (2,000 tonnes) of CO<sub>2</sub> emissions pa</li> <li>• 20% reduction in the number of lighting assets due to improvements in technology and uniformity of the lighting.</li> </ul>

**Lessons Learned and Recommendations**

<p><b>17. Positive reflections</b></p>	<p>This project can be seen as a considerable success, generating a significant amount of interest from fellow lighting professionals as well as those looking at wider lighting studies such as the Centre for London, Historic England and the London School of Economics.</p> <p>We also appreciate the keen interest of Members, and the occasional night walks will be reinstated by popular demand once safe to do so.</p>
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	<p>Otherwise, to reiterate, the successful delivery of the project was founded on a positive relationship with stakeholders, the supply chain, designers and contractors in the lighting world.</p> <p>By involving the supply chain from the outset and demonstrating the added value that could be achieved, the correct choices were made in terms of the CMS and lighting products, which also made installation and maintenance better, quicker and cheaper.</p> <p>Although the project pre-dates the adoption of both the Transport Strategy and the Climate Action Strategy, the outcome adheres to these principles and provides monetary and environmental savings.</p> <p>As noted above, the scheme has been delivered within the agreed budget and on time. Agreeing the design principles and objectives at an early stage helped to focus the project team, reducing the need for lengthy negotiations on items such as scope, design details etc.</p>
<p><b>18.Improvement reflections</b></p>	<p>Improvements were made throughout this project and regular process meetings were undertaken. Based on this approach, there were many lessons learnt at the start but by the end everything ran very smoothly. However, it should be noted that resources within Riney were at times stretched due to the LED rollout and BAU activities, requiring the use of subcontractors who needed a greater degree of management oversight and monitoring than usual. Once we moved to the side road and alleyway phases, we had dedicated gangs provided from Riney's with local knowledge. This was key to the successful deliver of the project and something to note for future works. One area that does need to continue improving beyond this project is the need to integrate more closely with the Energy Management team to understand, but more importantly influence changes in energy costs and their associated contracts.</p>
<p><b>19.Sharing best practice</b></p>	<p>Best practice was shared throughout this project, with various events and webinars and the support of the Lighting Urban Community International (LUCI) enabling it to be shared on an international basis. Some of those Webinars and events have bene organised by the New London Architecture, English Heritage and the Centre of London.</p>
<p><b>20.AOB</b></p>	<p>This project has significantly changed the City's night-time look &amp; feel in providing the right type of lighting, in the right location</p>



	<p>and at the right time, and it has transformed how we're able to manage it going forward.</p> <p>The concept of being able to truly control our lighting prompted the discussion that eventually led to the creation of the City's innovative Street Lighting Strategy, and correctly anticipated the need to refocus the agenda on sustainability and reducing energy-related emissions.</p> <p>As a result, the City is now seen as a leading light for such concepts, with other initiatives such as the Illuminated River and the upcoming planning guidance on lighting for buildings helping the Square Mile take centre stage.</p>
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**Appendices**

<b>Appendix 1</b>	Photos of the project deployed within the City of London.
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