

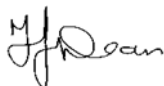
LONDON BOROUGH OF CAMDEN	WARDS: Regents Park, St Pancras and Somers Town
REPORT TITLE BMX CYCLE TRACK FOR HARRINGTON SQUARE GARDENS (CENV/2016/12)	
REPORT OF DIRECTOR OF CULTURE AND ENVIRONMENT	
FOR SUBMISSION TO Cabinet Member for Customers, Communities & Culture	DATE 4th March 2016
SUMMARY OF REPORT This report sets out a recommendation to develop a BMX cycle track for children and young people in Harrington Square Gardens (HSG), subject to planning approval and securing external funding. It explains the background to the recommendation and how it was arrived at, including a location option appraisal and public engagement. A number of other locations were considered but HSG came out on top against all evaluation criteria. There was significant engagement over a 5 month period with local residents, key stakeholders and children and young people, which yielded mixed responses. Some residents expressed various concerns about locating a BMX track at HSG. However, it is considered that these concerns can be addressed or can be mitigated against. Other residents expressed support for the idea. Recent research commissioned by ProActive Camden (the borough strategic partnership for sport and physical activity) found significant demand for BMX by children and young people in Camden and unmet need. Recent engagement with 200 local children and young people confirmed the demand. A BMX track in HSG will be an accessible location for young people from some of the most deprived areas of the borough. The intended outcome is an increase in participation in cycling and all the attendant benefits (e.g. health and wellbeing and community resilience) of physical activity consistent with the Camden Plan. Cabinet members for Sustainability and Green Spaces, Young People and Economic Growth, Transport, and Housing have been consulted. Local Government Act 1972 – Access to Information Briefing Note for Councillor Hai 5th June 2015; ProActive Camden Children and Young People’s Needs Analysis 2014; and BMX Frequently Asked Questions. Contact Officer: Nigel Robinson, Head of Sport & Physical Activity Sport & Physical Activity Service, Customers, Communities & Culture, Culture & Environment, 4th Floor, 5 Pancras Square, London N1C 4AG Telephone No: 020 7974 1614	

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WHAT DECISIONS ARE BEING ASKED FOR?

The Cabinet Member for Customers, Communities & Culture is asked to approve the development of a BMX track at Harrington Square Gardens subject to planning approval and securing external funding as set out in paragraph 4 of the report.

Signed:

A handwritten signature in black ink, appearing to read 'Fiona Dean'.

Fiona Dean
Assistant Director of Culture and Customers
Date: 24th February 2016

1. WHAT IS THIS REPORT ABOUT?

- 1.1 This report sets out the basis of a recommendation to develop a BMX cycle track (the 'Track') predominantly for children and young people in Harrington Square Gardens (HSG), subject to further design development, planning approval and securing external funding. HSG is situated in Regents Park ward, close to Mornington Crescent, and is bordered by Hampstead Road on the west side and Harrington Square (road) to the west. On the south side is Lidlington Place. See Appendix A – HSG site plan and park area in scope.
- 1.2 BMX cycling is an Olympic sport. The bicycles are small and compact compared with other forms, and designed for undulating surfaces and banked corners. The track would take the form of a surfaced circuit with a series of mounds at various heights. The areas either side of the track would be landscaped to enhance the visual impact of the facility, and would take the appearance of a series of grassed mounds. The majority of the track would be contained in the 'extension' area of HSG adjacent to Lidlington Place. See Appendix B – Example BMX facility in Hammersmith.
- 1.3 The track would be a public facility that would be open at the same time as the Gardens. Customers may use the facility unsupervised whenever they wish during these times (the park is open during daylight hours). There would also be supervised sessions and potentially competitions.
- 1.4 The track would be suitable for all abilities and fitness level. Based on other facilities of this kind it is expected that the core user group will be young people between the ages of 9 and 13.
- 1.5 The aim of the project is to meet the known need of children and young people in Camden for a track and increase participation in physical activity.
- 1.6 In addition there would be added value from re-animating this underused and misused space. It routinely attracts street drinkers, which is a deterrent to other HSG users.
- 1.7 HSG is one of a number of potential sites for a track that were considered. Only Talacre Gardens and Kilburn Grange Park were shortlisted along with HSG. Of these HSG was considered to be the most suitable according to the evaluation criteria used. This includes proximity and reach to areas of greatest deprivation in Camden. HSG is immediately accessible to St Pancras and Somers Town and Regents Park wards, the first and sixth most deprived wards in the borough respectively, and those with the lowest levels of sport and physical activity participation in Camden. It is also less than 1km from Kings Cross and Camden Town with Primrose Hill wards (7th and 8th most deprived respectively). See 'Options' below for more details of the selection process.
- 1.8 Underpinning this is the strong correlation between deprivation, physical inactivity and poorer health outcomes. HSG provides an opportunity to meet need where it is greatest and therefore maximise impact. Also, prioritising greatest need is typically a core requirement of external funding providers for projects of this kind, including Veolia Environmental Trust (VET). They have shown an interest in providing capital funding, in principle.

- 1.9 The idea of a track in Camden emerged over 2 years ago. It followed the ProActive Camden (PAC) Children and Young People's needs analysis, which identified significant unmet demand for a track in Camden. PAC (the strategic voluntary partnership for sport and physical activity in Camden) subsequently made this a priority objective. The Sport & Physical Activity Service (SPA) consequently joined forces with Access Sport to take the Track idea forward. Access Sport (AS) is a voluntary organisation for the strategic development of BMX in England. They formed to fulfil this mission as a London Olympics legacy project, in partnership with Sport England.
- 1.10 In summer 2014 the partnership decided to physically test the local appetite for BMX in the borough by staging a series of BMX 'come and try' events (using a pop-up BMX track) at 4 local sites during the summer of 2014. The sites were Talacre Gardens, Cantelowes Gardens, Castlehaven, and Harrington Square Gardens (HSG). These sessions were funded by Camden and Islington Public Health. The events were a great success attracting over 500 residents. 30% of the participants were female, 51% from a black or ethnicity minority and 29% were inactive.
- 1.11 Subsequently an assessment was undertaken to identify the most appropriate site for a track. HSG emerged as the most suitable option across a range of criteria. A subsequent, more detailed, feasibility review of the site (considering a potential layout in more detail and site-specific constraints such as existing trees), demonstrated a track would be viable with limited impact on the rest of the space. External funding options were explored and an expression of interest was submitted to the VET. They support the HSG scheme in principle, subject to their standard conditions including planning approval.
- 1.12 Cabinet members for Sustainability and Green Spaces, Young People and Economic Growth, Transport, and Housing have been consulted.

2. WHY IS THIS REPORT NECESSARY?

- 2.1 This report is required as this is a key decision in that the decision is assessed to be significant in terms of its effects on communities living or working in an area compromising two or more wards or electoral divisions in the area of the London Borough of Camden.
- 2.2 Key decisions are required to be entered onto the Forward Plan and heard by Cabinet. Papers need to be made publicly available and hence this report is required to inform both the Cabinet and public accordingly.
- 2.3 Another key factor is the proposed scheme is ambitious and received a mixed response from the public engagement. Some residents of HSG raised a number of concerns. Other residents support the scheme as do the majority of young people that were engaged through local schools and community centres.
- 2.4 Given the perceived challenges of the proposed scheme it is important that the Cabinet Member for Customers, Communities & Culture is made fully aware of the facts in order to make an informed and robust decision. The report sets out the perceived challenges, officer's view of the extent of the risk and proposed mitigations.
- 2.5 See Appendix C for details of the engagement process, outcome, perceived risks and proposed mitigation.

3. OPTIONS

- 3.1 HSG is one of a number of potential sites for a track that was considered. From a list of Camden's parks and open spaces, a number of criteria were used to narrow down the options.
- 3.2 Initially, sites were excluded which were not considered viable for a range of practical reasons. These included:
- Sites leased from third parties (requiring additional permissions);
 - Registered Parks and Gardens (the equivalent of a listed building)
 - Sites with previous funding constraints (e.g. Heritage Lottery Fund grant conditions);
 - Sites not open to the public on a daily basis (such as some nature reserve sites);
 - Sites without a minimum area of 40m x 20m available (which is the minimum required for a Governing Body compliant BMX track);
 - Sites with existing improvement proposals, community projects, or external influences which conflict with the BMX proposal;
 - Sites which are not within easy reach of an area of lower sport and physical activity participation; and
 - Sites which would not be seen as open access for young people, for example pockets of green spaces on housing land.
- 3.3 This filtering process resulted in a shortlist of three sites. These were then scored based on three secondary criteria based on the intended outcomes of the project:
- Average Indices of Multiple Deprivation Score within a 1km radius (to indicate how well the facility would meet the needs of more deprived communities);

- The number of schools within a 1km radius (to indicate the potential for maximizing usage and working with schools and developing organized activities);
- Average physical activity levels within a 1km radius (to indicate how well the facility could address health inequalities); and

3.4 The results of this scoring are summarized below:

Park site	Ward	Average IMD (*) score within 1km radius	Deprivation ranking	Primary Schools within 1km	Secondary schools within 1km	School proximity ranking	Average physical activity levels in 1km radius	Physical activity ranking
HARRINGTON SQUARE	Regent's Park	33.55	1	10	3	1	24%	1
TALACRE OPEN SPACE	Haverstock	29.66	2	9	2	2	28.60%	2
KILBURN GRANGE	Kilburn	25.75	3	5	0	3	30.30%	3

(*) Indices of Multiple Deprivation

3.5 Harrington Square Gardens scored highest in all three criteria. The key strengths of HSG as a site for a BMX track include:

- HSG is a public open space located on Hampstead Road. Mornington Crescent Tube Station is less than 500m and the site is served by a number of bus routes.
- The site is located in Regents Park ward and close to the border with St Pancras and Somers Town. Both wards are in the lowest band of sport participation nationally (against the measure of 3 x 30 minutes of participation per week, by Sport England's Active People Survey). HSG is the only shortlisted site which is immediately accessible to areas in the lowest band of physical activity.
- The site is easily accessible to local schools, youth and community groups. Richard Cobden, Edith Neville, St Mary & St Pancras, Christ Church, Netley, Maria Fidelis, Regents High schools are all within 500m radius of HSG. Somers Town Youth Centre, the Surma Centre, New Horizons, Fitzrovia Youth in Action and Samuel Lithgow youth and community are also within 1km radius of HSG. The track is aimed primarily at children and young and should be located close to where they live and play to encourage and facilitate take up, conveniently. Schools and other organisations are also useful marketing and communication channels and potential group users of the site.
- There are plans to improve the transport infrastructure around HSG, which are intended to make it even safer for cyclists and future HSG users. For more details see 'Consultation' below.
- The site is not directly associated with a particular estate or neighborhood, and can be considered as 'neutral' by young people. Groups of young people, consciously or otherwise, are prone to 'adopt' a geographical territory, usually in close proximity to where they live. Specific places within these 'territories' can be perceived as no go or unsafe to young people from outside the area.

- 3.6 Through our schools engagement it was clear that Harrington Square was seen as a neutral space, and this was corroborated by Camden's Community Safety team.

4. WHAT ARE THE REASONS FOR THE RECOMMENDED DECISIONS?

- 4.1 The recommended decision is the go ahead to develop a BMX track in Harrington Square Gardens.
- 4.2 The reasons for this are a number of other locations were considered but HSG came out on top against all the evaluation criteria.
- 4.3 Although some residents expressed various concerns about locating a BMX track at HSG, Camden officers are confident that the concerns can be addressed (See 'Consultation' above). Other residents expressed support for the idea.
- 4.4 The recommended decision would address need for a facility of this kind. Recent research commissioned by ProActive Camden (the borough strategic partnership for sport and physical activity) found significant demand for BMX by children and young people in Camden and unmet need. Recent engagement with 200 local children and young people confirmed the demand.
- 4.5 A BMX track in HSG will be an accessible location for young people from some of the most deprived areas of the borough, where the level of physical activity participation is lowest. The intended outcome is an increase in participation in cycling and all the attendant benefits (e.g. health and wellbeing and community resilience) of physical activity in line with the Camden Plan.

5. WHAT ARE THE KEY IMPACTS / RISKS? HOW WILL THEY BE ADDRESSED?

- 5.1 If the proposal to proceed with developing a BMX track at HSG is approved there are a number of risks, set out below.

RISK	MITIGATION
Planning approval for the track is refused	The planning application will be compliant with planning regulations and guidance. It will accord with the Local Plan, Camden Plan, the ProActive Sport & Physical Activity Strategy, National Strategy for Sport and Physical Activity, London Sport's emerging strategy and the national Governing Body's national strategy for cycling.
External funding is not secured	There has been a positive response from Veolia Environmental Trust to an expression of interest for funding the HSG BMX track. If a full application fails there a number of other funders that could be approached for this scheme.
HS2 disrupts the proposed BMX scheme	Access to HSG can be mitigated through appropriate signage and appropriate re-routing. Any impact on the track itself can be accommodated and built in to the design of the track.

6. WHAT ACTIONS WILL BE TAKEN AND WHEN FOLLOWING THE DECISION AND HOW WILL THIS BE MONITORED?

- 6.1 If approval is given by the cabinet member to develop a BMX track at HSG, the scheme will be worked up to a degree of detail sufficient for a planning application. If successful, a full funding application will be prepared and submitted and, subject to the outcome, a works contractor will be procured to build the track. Assuming there are no significant obstructions and delays the track should be installed in late 2016, early in 2017. See Appendix E titled Project Delivery Plan.

7. LINKS TO THE CAMDEN PLAN OBJECTIVES

- 7.1 A BMX track in HSG would contribute to a number of Camden Plan objectives as follows.
- 7.2 ***Developing new solutions with partners to reduce inequality***
The new BMX track would be situated in one of Camden's most deprived areas, re-activating an important public space and helping to address health inequality.
- 7.3 ***Investing in our communities to ensure sustainable neighbourhoods***
Establishing a volunteer-led, community BMX club at the site would provide opportunities for local people to be part of a community 'owned' and run entity and develop people and organisational skills in the process. This Club would be self-sustaining and viable going forward.
- 7.4 ***Creating conditions for and harnessing the benefits of economic growth***
The BMX club will provide personal development opportunities for local people, such as bicycle mechanics and maintenance training, cycle coaching, child protection and operating a public leisure facility. The club will act as a stepping stone into training, education and employment.
- 7.5 The presence of a vibrant, well-attended BMX facility in HSG should reanimate the park and make it feel safer and more appealing. This speaks to the safer communities agenda.

8. CONSULTATION

- 8.1 If consultation and engagement is to be undertaken in respect of any decision, to be proper and legally sound it must be undertaken when proposals are still at a formative stage, it must allow sufficient information for these being consulted to give an intelligent consideration and an intelligent response on the matter, adequate time must be given for this purpose and the results of the consultation must be conscientiously taken into account when the decision is taken. The consultation and engagement in respect of this proposal has sought to give effect to these principles.
- 8.2 A public and stakeholder engagement exercise was undertaken in 2 phases. The purpose was to inform interested parties about the proposal to develop a BMX track at HSG and solicit feedback to help share the future scheme if one is progressed.
- 8.3 The first phase commenced in June 2015 and consisted of letters to 300 homes around HSG. The letter explained the scheme and invited feedback direct to Camden officers or via an online discussion forum. This also contained FAQs and responses.

- 8.4 We received written objections to the proposal from 5 residents and a petition with 32 signatures, also objecting to the proposed scheme.
- 8.5 We received 2 letters of support from local residents and Councilor Hai received a number of emails of support from local families.
- 8.6 The second phase (Autumn 2015) comprised engagement with local schools and youth/community groups. This consisted of BMX taster sessions and Q & A with young people. The majority of the 180 young people we met said they wanted a BMX track in the borough and would use it. We were careful not to disclose the proposed location.
- 8.7 The engagement process, concerns expressed by local residents and the responses from Camden, and supportive feedback are detailed in Appendix C.

9. LEGAL IMPLICATIONS

- 9.1 The Borough Solicitors Department has been consulted and comments inserted in the report.

10. RESOURCE IMPLICATIONS

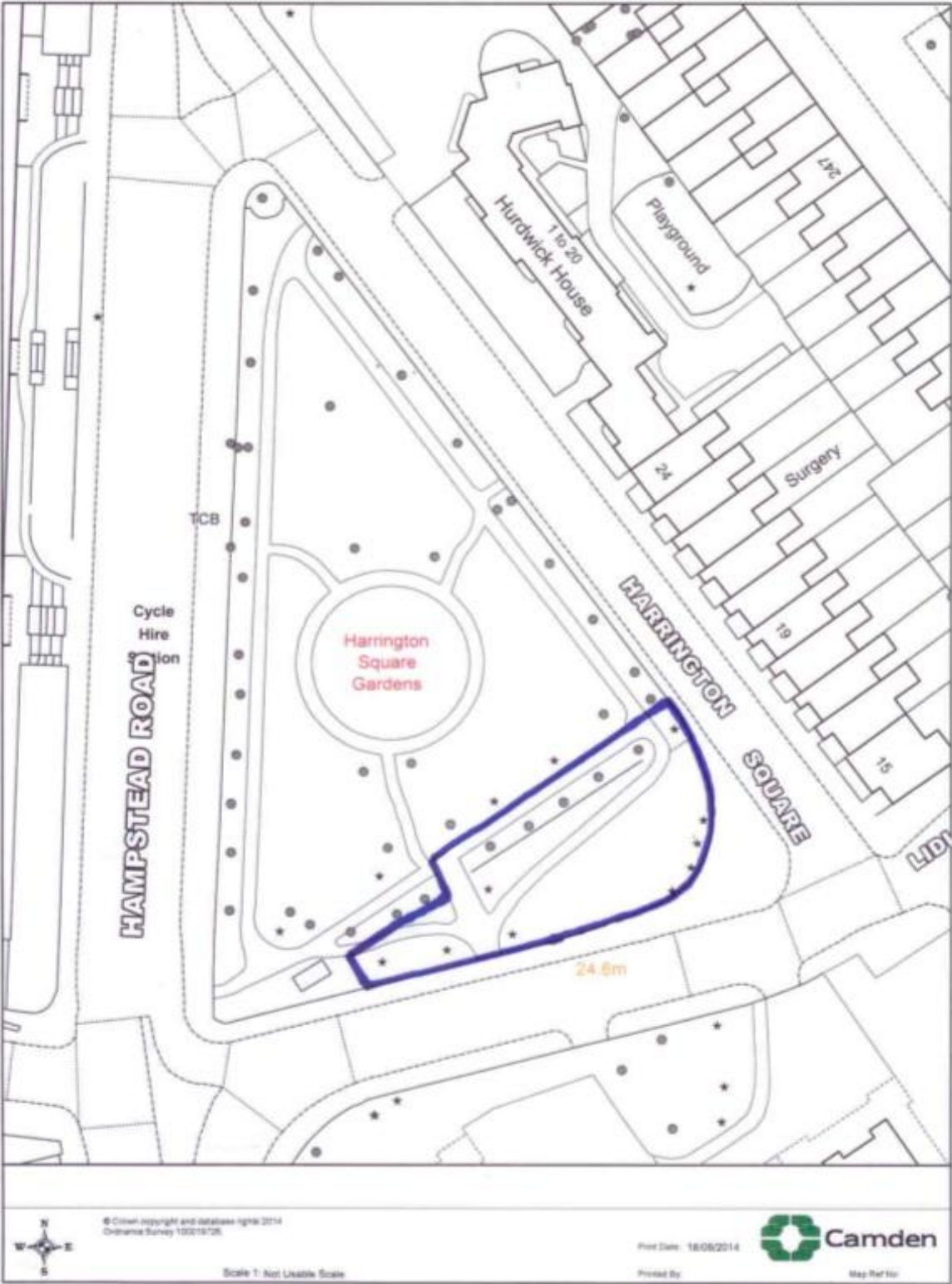
- 10.1 This report recommends that the cabinet member approves the development of a BMX track at Harrington Square Gardens subject to securing planning permission and external funding.
- 10.2 External funding will be sought to cover the initial capital costs for installation of approximately £80,000.
- 10.3 On-going revenue costs are estimated to be in the region of £3,000 per annum which it is proposed will be covered by s106 funding already secured for the park in the first 3 years of the scheme. On-going funding options including volunteer support will be considered as part of the project development.

11. APPENDICES

Appendix A: HSG site plan showing area in scope
Appendix B: BMX facility in Hammersmith, London
Appendix C: Outcome of the Engagement Process
Appendix D: Pollution Risk
Appendix E: Project Delivery Plan

REPORT ENDS

Appendix A: HSG site plan showing area in scope.



Appendix B – BMX facility in Hammersmith, London.



Appendix C: Outcome of the Engagement Process

Summary of schools and youth/community group engagement

During November 2015 youth engagement was conducted with 3 schools, 1 youth group, and a 'pop-up' session in Somers Town, all within the catchment of the proposed facility. Camden officers spoke with 180 young people 9-13 years old over a 4 week period to understand what young people's knowledge was of the sport, and to provide a trial of the sport (for example in the school playground). The majority of young people who tried the sport said they would like to do it again.

Summary of Community conversation

At the end of the second phase of engagement a Community conversation was held that brought together local people for a discussion on the proposals with officers and Councillors. The event was held at Dick Collins Tenants Hall on Redhill Street and advertised through a letter distributed to properties around Harrington Square and through schools. The event was attended by 14 local residents, including a number of young people who participate in the local session on Charlton Street and a number of other residents. Other attendees included volunteers from a track in Hammersmith and Fulham.

Concerns raised by some residents and Camden's response

In two phases, the first phase of engagement commenced in June 2015 and consisted of letters to 300 homes around HSG. The letter explained the scheme and invited feedback direct to Camden officers or via an online discussion forum. This also contained FAQs and responses.

We received written objections to the proposal from 5 residents and a petition with 32 signatures, also objecting the proposed scheme.

"The scheme will take up too much of the present park space"

The intention is to enhance and re-animate the space with visually attractive and interesting re-landscaping, complimentary and blended with the setting in the form of the BMX track. The track would not be hard surfaced to, again, blend with the soft surrounding landscape. It will take up only 1/3 of the existing space. Not only will it look good but provide much needed and accessible amenity for physical activity for children and young people in an area of significant need

"Air pollution risk for young cyclist's lungs"

There is a body of research which finds the risk of exercising in a polluted (air) environment is outweighed by the health benefit [See Appendix D, Pollution Risk].

Research also shows pollution levels decrease sharply away from the roadside. HSG has some natural screening surrounding it, which contributes to this. Pollution levels around HSG are not unique and are likely to be similar to those found in other potential locations already considered for siting this scheme

"Road Safety risk for young cyclists"

Cycling anywhere in London carries a degree of risk. The risks for cycling to and from HSG have been assessed and the following mitigations would be taken forward.

The Track will only be accessible by bicycle from the South West corner of the park, which will be on the North-South route. As part of the cycle grid development this junction will be transformed for cyclists, and we will integrate plans for the track with this so that the site can be accessed safely. An East West cycle route is currently planned and we await TfL's confirmation that they have allocated funds for this.

Camden Transport officers believe the proposed BMX track may act as leverage on TfL to gain further investment into this scheme.

London Cycling Campaign has indicated that their support is contingent on two way segregated cycling along Lidlington Place, which is also proposed.

The current configuration of pedestrian crossings is also being reviewed and changes will be made to enhance safety where possible (in conjunction again with TfL). This will be consulted on in summer 2016.

“The effect of HS2 will present significant complications for the proposed scheme”

From what we know right now any impact of HS2 on access to HSG can be mitigated through appropriate signage and appropriate re-routing. Any impact on the track itself can be accommodated and built in to the design of the track

“It is stated that the park is ‘under-used’. What is the evidence for this?”

Visits to Camden’s green spaces are not systematically recorded. But there is a significant and routine presence of Camden staff and contractors in all our green spaces throughout the year. They know our green spaces very well including the extent of their use and by whom. This is not a precise measurement but valid evidence nevertheless

“Road Safety risk for young cyclists”

Cycling anywhere in London carries a degree of risk. The risks for cycling to and from HSG have been assessed and the following proposals are being considered.

It is proposed that the Track will only be accessible by bicycle from the South West corner of the park, which will be on the North-South route. As part of the cycle grid development this junction will be transformed for cyclists, and we will integrate plans for the track with this so that the site can be accessed safely. An East West cycle route is currently planned and we await TfL’s confirmation that they have allocated funds for this.

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The current configuration of pedestrian crossings is also being reviewed and changes will be made to enhance safety where possible (in conjunction again with TfL).

“The effect of HS2 will present significant complications for the proposed scheme”

From what we know right now any impact of HS2 on access to HSG can be mitigated through appropriate signage and appropriate re-routing. Any impact on the track itself can be accommodated and built in to the design of the track.

“Increased risk of anti-social behaviour”

There is already ASB in the park from street drinkers. There is a risk that a minority of young people may cause ASB. The same fears were expressed about the Cantelowes Gardens Skate Board facility and our Outdoor Gyms. In the event neither has resulted in any significant or unmanageable ASB.

Young people told us they want BMX provision and experience of BMX provision elsewhere has not resulted in an increase in ASB. In fact just the opposite. The evidence suggests that young people generally ‘own’ their BMX facility, behave appropriately and respect their BMX track and its location.

Examples include the London Borough of Greenwich a BMX facility. This was built in Hornfair Park, which previously saw significant drug use. A BMX track transformed the use of the park, and despite opposition in advance, has been welcomed by local residents and Councillors and has been highlighted by the Mayor of Greenwich as a positive attribute to the borough.

A proven way of limiting ASB in situations such as this is for local people to take 'ownership'. To that end it is proposed to create a community led BMX club at the site. This will provide technical coaching and safety for young BMXers and the attendant personal development and social skills that are inherent benefits of participating in sport and physical activity.

These include respect for place and people, personal discipline, commitment, self-respect and esteem and good behaviour generally. The plan is to grow the club over time to become a 'family' of committed BMXers that cherish and love their track and become a valued section of the HSG community of users.

It is not anticipated that the track will result in additional noise. The track surface is not hard finished and relatively soft, which will absorb impact of the bikes and limit noise. Young cyclists will wear safety helmets most of the time, which mitigates vocal noise nuisance.

Appendix D: Pollution Risk

Summary of evidence relating to the impact of air pollution and physical activity on health

This paper covers the benefits of cycling versus the health risks of air pollution and current air pollution levels, as follows:

- 1) Benefits of cycling v. health risks of pollution
- 2) Pollution levels

1 Benefits of cycling v. health risks of pollution

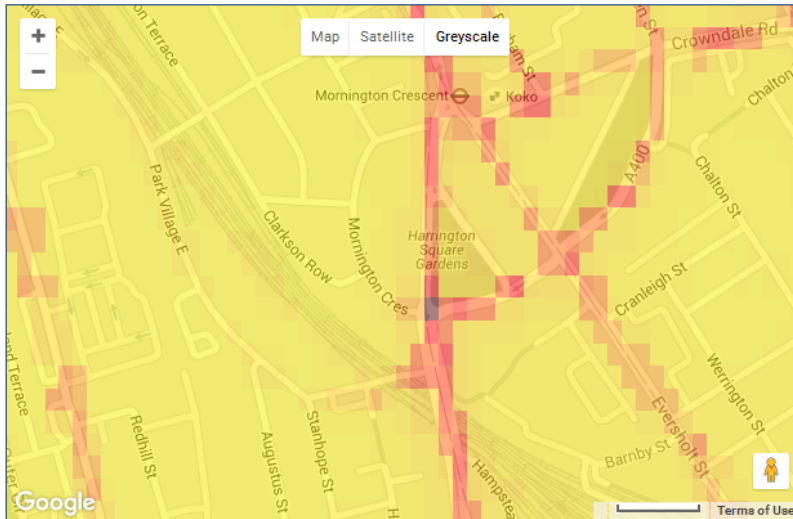
- 1.1 The benefits of being physically active outweigh the negatives of exercising in a polluted area. This has been demonstrated repeatedly by independent researches, collated in the attached table. Many studies focus on the benefits of cycling on roads outweighing the risks from air pollution – in the case of HSG these benefits are likely to be even greater due to location of the BMX away from the roadside (see Section 2).
- 1.2 It was recently estimated that up to 9,400 deaths in London could be attributed to the effects of air pollution in 2010.¹ This statistic while alarming is dwarfed by the number of deaths caused by inactivity over the same period. Other research² has estimated that 20,000 people died due to being inactive in 2010. Furthermore the 9,400 deaths due to pollution were as a whole, rather than during exercise. The accompanying table contains studies.
- 1.3 There is no evidence that the impact of cycling in a polluted environment is more significant for children and young people, i.e. young lungs

2 Pollution levels

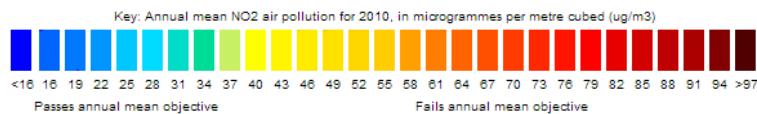
- 2.1 It is well established that air pollution is highly localised, and as such reduces substantially as you move away from the roadside. The map extract below shows modelled levels around Harrington Square Gardens, where the sharp drop off in pollution (represented by NO₂) away from roads can be clearly seen.

¹ Understanding the Health Impacts of Air Pollution in London (2015) available at https://www.london.gov.uk/sites/default/files/HIAinLondon_KingsReport_14072015_final_0.pdf

² Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy (2012) available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3645500/>



Modelled annual mean NO₂ air pollution, based on measurements made during 2010.



- 2.2 The exact reductions in pollution concentrations as distance from the roadside increases is dependent on a large number of factors, including background levels, the make-up of traffic on the road, any green screening, prevailing wind direction, topography etc.
- 2.3 However there is Defra guidance³ that includes an equation for calculating an estimate for reductions from roadside. Using the Defra background concentration for the area around HSG (an annual mean NO₂ of 38 µg/m³), and monitored levels at the southwest corner of the Gardens (55 µg/m³ from one months' data, with additional monitoring ongoing), the Defra calculator provides the following results:

Distance from roadside	Projected annual levels	Reduction from roadside levels (55 µg/m ³)
5m	45.8 µg/m ³	16.7%
10m	44.2 µg/m ³	19.6%
15m	43.3 µg/m ³	21.3%

- 2.4 This equation is often seen as being fairly conservative. However the results from the table above show a marked drop off in pollution levels just 5m from the roadside around HSG. These levels are reduced to the extent that they are not significantly higher than the projected background level of 38 µg/m³.
- 2.5 Other empirical studies⁴ have shown that the reductions in levels around 5m-10m from the roadside can be as much as 40%, while other studies have shown that even

³ LAQM Technical Guidance LAQM.TG(09), 2009; available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69334/pb13081-tech-guidance-laqm-tg-09-090218.pdf

⁴ NO₂ Concentration and Distance from Roads, 2008; available at <http://laqm.defra.gov.uk/documents/FallOffWithDistanceReptJuly08.pdf>

walking on the far side of a pavement to a busy road can reduce exposure levels by a third⁵.

- 2.6 In the case of HSG, the reduction in levels is likely to be even greater than that suggested by the Defra equation due to the green screening that may further protect users of the Gardens from pollution from the road. While the prevailing wind is south-westerly, this is not considered significant in considering likely pollution level drop-off in the Gardens.

⁵ London Evening Standard, 2014; available at <http://www.standard.co.uk/news/london/walk-away-from-kerb-to-avoid-fumes-in-london-adviser-urges-9335615.html>

Table 1 - Collated research										
Title	Authors	Year	Purpose	Relevant context	Sample Size	Location	Method	Key findings	Discussion	Conclusion
Do the health benefits of cycling outweigh the risks	Johan de Hartog, J.; Boogaard, H.; Nijland, H.; Hoek, G.	2010	Following promoting cycling as a mode of transport across Europe in an obesogenic environment. This papers aims to weigh up the advantages and risks to increased physical activity in urban/commuter environments	Similar environments are being investigated as to whether the health risks outweigh the benefits of cycling in an urban area as addressed in the HSG proposal	Systematic review of published papers	Focus on the Netherlands environment	results from 69 published papers were triangulated to see the main outcomes against health effects, societal effects, accident incidence, impact on physical activity and life quality/years	Substantial health benefits were determined from cycling even in air polluted areas, although increased exposure to air pollution and increased risk of accidents were found for cyclists compared to car drivers. Cyclists have the option of using other roads that aren't as busy therefore will limit the impact of these aspects	Encouragement of cycling will ultimately outweigh the risks as more people starting to cycle will limit the risks against car drivers and the incidence of accidents and exposure to air pollution	On average, the estimated health benefits of cycling were substantially larger than the risks of cycling relative to car driving.
The health risks and benefits of cycling in urban environments compared with car use: health impact assessment study	Rojas-Rueda, D.; de Nazelle, A.; Tanio, M.; Nieuwenhuijsen, M.J.	2011	To estimate the risks and benefits to health by travel by bicycle sharing scheme, compared with travel by car in an urban environment	Studies an urban environment similar to HSG and considers the risks and benefits	181, 982 Biking subscribers (Barcelona Bike Sharing Scheme that launched in 2007). 25, 426 in the HIAF	Barcelona, Spain	Health Impact Assessment Framework (HIAF). Exposure-response functions were taken from existing studies and calibrated to the Barcelona population of Biking users	Compared with car users the estimated annual change in mortality in Barcelona by using Biking (n=181,982) was 0.03 deaths from RTAs and 0.13 deaths from air pollution. As a result from the increase of physical activity through Biking, 12.46 deaths were avoided and the CO2 emissions were reduced by 9,062,344Kg	These results corroborate with the findings of other health impact assessments of the multiple risks and benefits of active transportation. With the findings ultimately being positive towards cycling and that it outweighs the risks	Biking has increased cycling within Barcelona by 30% and has shown great health benefits to subscribers as well as to a marked reduction in car use and air pollution
Subclinical responses in healthy cyclists briefly exposed to traffic-related air pollution: an intervention study	Jacobs et al	2010	To find the difference between lung function and blood cell levels between road cycling and cycling in clean air in a pre-determined intervention study	Traffic related exposure to air pollution by road cycling. Weighing up the benefits and risks of cycling in air polluted areas	38 participants between ages 18-65, with a paid job, cycles regularly to work	Antwerp (Belgium). Similar pollution between HSG and road test area	Cycle for 5750 m on both a road (next to 10 lane motorway) and in clinical environment with clean air. Venous blood sample and exhaled NO measured	Small immediate increase in % blood neutrophil in road cycling. Platelet function on lung permeability showed no significant changes. No significant changes in exhaled NO. No changes in plasma levels	By testing over the same two sites consistently with all participants, bias was minimised. Doesn't investigate long term effects of air pollution.	There is strong evidence supporting that regular physical activity outweighs the risk of commuter cycling. The authors do not believe that cyclists should be discouraged from cycling to work in traffic.
The health effects of exercising in air pollution	Giles, L.V & Koehle, M.S.	2014	To compare, contrast and review 204 pieces of research on exercising in ambient and air polluted air	Studies for review in this paper investigate a variety of different scenarios that are relevant to the HSG proposal	204 papers reviewed	Worldwide	Results from 204 papers were triangulated to see the main outcomes on all physiological elements	Physical activity can assist in improving conditions that air pollution exacerbates. However, some conditions can be adversely affected by air pollution. Reviewing all documents there is significant weighting to the benefits of PA overall even in conditions with air pollution.	Recommendations from the review include, engaging with physical activity as the research for the cardio-protective functions are overwhelming. Consider an anti-oxidant rich diet and wearing a face mask to help protect against some of the effects of air pollution.	There is further research to be completed in the area of investigating the effects of air pollution on cognitive function. People should not be discouraged from undertaking physical activity in these environments
Active Transportation: Making the link from transportation to physical activity and obesity	Robert Wood Johnson Foundation	2009	To investigate the impact of certain factors on walking and cycling as a mode of transportation	To contextualise the impact of HSG on cycling as a mode of transport and facilitating physical activity	N/A	United States	Themes were found from a variety of studies on the barriers to walking and cycling as a form of transport and recommendations were then found to help reduce the barriers	Public transit use is linked with higher levels of physical activity. Walking or cycling can help children stay more active. Pavements and cycle lane encourage activity. Multi-use trails and purpose built free facilities in urban areas encourage activity in low income areas.	Most relevant point is the use of Multi-use trails and purpose built free facilities: This can connect population centres with desirable destinations. This type of trail increases physical activity in low income areas. 80% of people living nearby are more likely to meet to the physical activity guidelines.	Facilitating physical activity infrastructure will assist children in keeping more active and encourage people to use activity as a mode of transportation
Exercise and outdoor ambient air pollution	Carlisle & Sharp	2001	To establish the levels at which air pollutants are considered damaging to human health and to exercisers in particular.	examined 6 major urban air pollutants in relation to exercise	literature review containing 49 references	Brunel University	Review of relevant studies	CO is detrimental to athletic performance. NO2 is of concern to human health, but outdoor levels are low.	Reinforces the diagram of pollution levels, stating that said levels decrease substantially as you move away from the roadside.	Athletes and exercisers should avoid exercising by the road side, however park and green areas are safer to exercise in.

Appendix E: Project Delivery Plan

[illegible]