Hertsmere Options Long List

Long List of Options

HBC3 - Moatfield Road

Long list option	Option measure	Description	Option considerations	Viability Score (1 – Low viability, 5 – High viability)	Take Forward to short list?
Do nothing	Do nothing	All operational and maintenance activities cease	A reduction of maintenance within this hotspot would relate to a deteriorating condition of the King George Drain. The watercourse is largely culverted through the hotspot, and consequently any blockages would result in worsening of the existing flood risk. Furthermore, in the open sections of channel, limiting maintenance (e.g. vegetation cutting) reduces channel capacity and conveyance, potentially increasing flood risk.	N/A	Yes – For economic appraisal
Do minimum	Do minimum	Continue with current operational and maintenance activities	Continued maintenance of the King George Drain will ensure no deterioration in channel capacity and operation of existing assets. However, this option will not provide any betterment to the existing scenario and the standard of protection (SoP) will remain as per the existing.	3	Yes - For economic appraisal
Do more	Do more	Increased maintenance regime	Increased maintenance of culverts and sewers to include more regular jetting and better channel maintenance. This option would further reduce risks of blockage and localised flooding but would not fundamentally increase conveyance capacity and standard of protection to properties going forward. Furthermore, the dominant source of flood risk within this hotspot is surface water, and so increased maintenance of watercourses and associated structures would not have a significant impact upon the number of reported incidents in the area.	N/A	No

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Option 1	Allocation of Land within Local Planning	Long term designation of land, placing more vulnerable land uses away from at-risk areas.	Land re-designation involves altering land uses in at risk areas. Consequently, less vulnerable land-uses (e.g. recreation space, car parks etc.) are placed within the areas that have a higher chance of being flooded. Within this hotspot, properties around Homefield Road are in a naturally vulnerable area as they are within close proximity of the natural route of the watercourse (prior to being culverted). However, the properties are within a well-established town community – it is not feasible to re-designate the land use.	3	No
Option 2	Flow restrictions on outflows from new developments	Recommending restrictions on surface water outflows from new developments within the catchment (to greenfield runoff rates)	As the LLFA for the area, Hertfordshire County Council advise the LPA on the suitability of surface water drainage plans for new developments. The LPA can then lower runoff rates of a planned site, if justifiable through the Local Plan or SFRA. However, the current national and local standards do not require reducing flows from developments below greenfield rates. This wouldn't however constitute a stand-alone flood mitigation option.	2	No
Option 3	Natural Flood Management (NFM)	Natural flood management techniques (i.e. soil management, slowing water movement through catchment by use of planting, etc)	Long term effectiveness of this option may be difficult to prove. There are two large areas of green space within this hotspot which are a valuable part of the community, being utilised as recreation grounds. The impacts of land cover alteration, to community use, should be considered. There are various ways that the flow path through this field could be slowed down and volumes reduced. These include woodland creation, installation of swales or bunds, or excavation of ponds and temporary detention features. Although this could be considered as a	4	No

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			complementary interim measure, it cannot be relied upon as primary method of flood defense scheme.		
Option 4	Property flood resilience	Protection to individual properties (e.g. via air brick covers, door guards etc.).	Based upon EA guidance, PFR should only protect against flood depths up to 0.6m; beyond this the structural integrity of a property is at risk. Along Aldenham Road (whereby previous flooding has occurred), flood depths are shown to reach over 1m when no other mitigation methods are taken. Property flood resilience is not suitable and so other measures should be considered in addition. Property level options may be viable if other methods reduce flood depths.	3	Yes
Option 5	Storage of water within Moatfield Road recreation ground	Incorporate flood defence wall / embankment in the north of King George Recreation Ground and a detention basin in the east to capture runoff from the housing	The dominant flow path within the site flows through the recreation ground. Adding an obstruction within the grounds reduces the extent and depths of this flow path downstream, however, there is still flooding occurring along Moatfield Road whereby flood incidents have previously occurred. To be viable, options of drainage would be required for use during time of flood. This also prevents flooding of Bournehall Primary School which is shown in baseline modelling. For the properties previously flooded, flooding still occurs, however at lesser depths. Flow also enters the recreation ground from the housing along its eastern boundary. Ahead of the line of trees within the field, there is a band of grassy space that could be utilized as a storage area. Options to drain the area, at a time of flood, would be required in order for the scheme to be viable.	3	Yes

Long list option	Option measure	Description	Option considerations	Viability Score (1 – Low viability, 5 – High viability)	Take Forward to short list?
Option 6	Flood wall / earth bund in north of the hotspot, beyond allotment area and in the east along Farm Way	Incorporate flood defence wall / embankment	The flow path present beyond the gardens of Bournehall Avenue is noted to be responsible for the flooding affecting properties. Modelling the obstruction of this flow path shows that the previously flooded properties will still be impacted in the event of a flood. Blocking the flow path reduces flood depths around the properties but has a very minimal impact (compared to the other obstructions above).	3	No
Option 7	Management of runoff in Finch Lane and Herkomer Road area	Management scheme for roads surrounding Finch Lane / Herkomer Road to limit the volumes of runoff reaching Homefield Road	Overall aim of this management would be to limit the amount of runoff reaching the Homefield Road area. Surface water flow routes exist along Glencoe Road, Rudolph Road and Park Road which continue north-east to add to the flood risk along the Homefield Road area. Highway management could alleviate the risk by increasing the volumes stored within the roads. This could be achieved via increased kerb height. However, along Herkomer Road, there are several properties and so this would result in access issues. Disconnection of surface water may also be an option. The area has dense housing which results in a great deal of runoff from roofs. Consequently, if runoff from roofs was disconnected from the sewer system, there would be greater capacity within the surface water sewer system.	3	Yes
Option 8	Upsize existing sewers along Homefield Road	Larger sewers would have greater capacity to carry the flow.	Upsizing sewers in built-up area would have to take into account land ownership and existing utilities in the public roads. Incorporation of large diameter sewers unlikely to be viable. No scope for environmental enhancement.	2	No

Long list option	Option measure	Description	Option considerations	Viability Score (1 – Low viability, 5 – High viability)	Take Forward to short list?
			Maintenance of underground structures is also more difficult due to lack of visual signs of potential issues, like blockages and structural faults. Furthermore, jetting of pipework can sometimes lead to dislodging blockages from one location to another increasing flood risk.		
Option 9	Daylighting of culverted watercourse	Daylighting of the King George Drain (in the north of the hotspot) to return to a more natural state	Opening up of the culvert would increase the capacity and prevent the surcharging of manholes that is currently occurring. Properties along Spring Crofts are within the natural low point of the area, where the natural channel would have been, and so properties would be within very close proximity to the open channel Would involve a large construction project. Naturalisation of the watercourse would provide environmental enhancement.	3	No
Option 10	Retrofitting of SuDS	Disconnect direct runoff from existing roofs and roads from public sewers and route it via SuDS before re-connecting to public sewers.	Along Bournehall Avenue and Farm Way, there are grassy areas between the pavement and highway which provide opportunity for the construction of swales which would store and convey water which would normally exist in the highway. This would restrict the volumes of water that are reaching the at-risk area around Homefield Road.	4	No

Table 1: Viability scoring criteria

Assessment Criteria	Assessment criteria description	Do Minimum	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9	Option 10
Construction & Maintenance	Disruption for construction and maintenance are minimised	5	5	5	5	3	5	5	4	1	1	4
Design Capabilities	Number of properties protected from flooding by surface water runoff	0	0	0	3	2	4	2	4	4	1	3
Design Capabilities	Level of additional environmental benefit provided	0	0	1	5	1	1	1	1	1	5	5
Health & Safety	Risk to maintenance operatives is minimised	5	5	3	4	4	4	4	5	1	2	4
Public Acceptability	Overall acceptability of the scheme to the public	3	3	3	5	4	2	3	4	3	3	4
Natural Environment & Visual Amenity	No adverse ecological effect on flora and fauna	5	5	1	5	4	5	4	1	1	5	5
Natural Environment & Visual Amenity	Scheme minimises visual impact on surrounding area	5	3	1	5	4	5	3	1	5	5	5
Climate Change Adaptation	Design can be easily adapted to accommodate climate change impacts	0	1	1	2	3	2	2	3	1	1	2
Cost	Low capital investment required	5	5	5	3	3	3	3	4	1	2	3
Costs	Low maintenance costs	5	5	3	3	4	3	3	4	3	3	3
	Total (out of 50)	**33**	**32**	**23**	**40**	**32**	**34**	**30**	**31**	**21**	**28**	**38**
	Viability Score (out of 5)	**3**	**3**	**2**	**4**	**3**	**3**	**3**	**3**	**2**	**3**	**4**
Scoring Criteria	0 = Does Not Meet Criteria											
Please Note: All options are ranked comparatively	5 = Fully Meets Criteria											

Short list of Options taken forward:

- **Do nothing**
- **Do minimum**
- **Option 4 – Property flood resilience**
- **Option 5 – Storage of water within Moatfield Road recreation ground**
- **Option 7 – Management of runoff around Finch Lane and Herkomer Road**

Note: Options 1 and 2 relate to wider LLFA and LPA policy recommendation and therefore have not been taken forward for further investigation at this time.

Do-nothing Option Data

Summary Description of Option
No active intervention within the study area. No maintenance of watercourses / sewers undertaken. All assets approaching the end of their life allowed to fail.

Summary Advantages of Option
No costs incurred.

Summary Disadvantages of Option
Channel capacities will be reduced due to vegetation and debris. The risk of blockage of culverts and sewers will increase due to accumulated debris / sediment. The existing measures would cease to protect properties to the current standard. Overall flood risk would be expected to increase, and additional properties could be put at flood risk.

Summary of Option Viability and Deliverability
The Do-nothing scenario is not viable in a well-developed area like Bushey and should not be considered further. This option is however taken to the short list as it forms the comparative case in the economic analysis.

Do-minimum Baseline Option Data

Summary Description of Option
Existing maintenance regime to continue and existing assets to be repaired as required to ensure the current standard of protection is maintained. This scenario still poses flood risk to a number of properties in the area. This will not prevent future increase in flood risk as a result of climate change.

Summary Advantages of Option
• Affordable (No capital spend). • Maintains the existing situation.

Summary Disadvantages of Option
• Does not provide any reduction in flood risk. • Potential for maintenance requirements (and costs) to increase over time.

Summary of Option Viability and Deliverability
This option is viable and can be delivered but offers no betterment to the existing scenario and will still result in an increased flood risk in the future due to climate change.

Standard of Protection Provided by Option

Based on the integrated surface water modelling of the area the level of protection offered by the current arrangement is less than a 1 in 5-year standard.

Number of Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario Very Significant Risk (>5% AEP)	**Number of Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario** Significant Risk (Between 5% and 1.3% AEP)	**Number of Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario** Moderate Risk (Between 1.3% and 0.5% AEP)	**Number of Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario** Low Risk (< 0.5% AEP)
363	52	95	140
Number of Non-Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario Very Significant Risk (>5% AEP)	**Number of Non-Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario** Significant Risk (Between 5% and 1.3% AEP)	**Number of Non-Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario** Moderate Risk (Between 1.3% and 0.5% AEP)	**Number of Non-Residential Properties at Risk from Flooding in Baseline Do-minimum Scenario** Low Risk (< 0.5% AEP)
0	0	0	0

Option 4 – Property Flood Resilience

Summary Description of Option
Property Flood Resilience measures including flood doors, self-closing air bricks, etc. to be offered to all residential properties at risk of 1 in 75-year flooding.

Summary Advantages of Option
• No land take. • Work areas limited to individual properties thus limited risk of difficult ground conditions, utility clashes, access constraints etc.

Summary Disadvantages of Option
• Does not address causes of flooding. • Some properties may not be suitable / property owners may not want such measures. • Adoption by all properties within allocated area may be required to ensure full potential of this option is achieved.

Summary of Option Viability and Deliverability
PFR remains a viable standalone option particularly for smaller groups of affected properties and may also be considered as an alternative or complimentary to other capital schemes.

Standard of Protection Provided by Option	1 in 75-year to all affected properties.

Option 5 – Flood wall / earth bund within Moatfield Recreation Ground

Summary Description of Option
1. Construction of a bund along the north-western boundary of the Moatfield Recreation Ground

Summary Advantages of Option

- Can provide a good standard of protection.
- Opportunities for environmental and aesthetic enhancement, visual amenity and/or habitat creation.
- Will provide protection for the primary school as a well as the properties in the Homefield Road area.
- Construction / operation works do not affect individual properties.
- Visual reassurance to the local residents that they are protected against flooding.
- Overground storage features are easier to maintain than underground structures due to their accessibility and visually apparent blockages / degradation, etc. that require attention.

Summary Disadvantages of Option

- Relatively high capital costs.
- Residual risk of overtopping or failure.
- Excavations required thus risk from potentially high groundwater levels / ground stability / contamination and existing utilities in the area.
- Construction materials will be required from off-site.

Summary of Option Viability and Deliverability

Construction of the bund is shown within modelling to be an effective method of reducing the flood risk to the Homefield Road area. The boundary between the school land and the recreation ground is an ideal location for the construction as there is already a line of trees here defining the boundary, and so there will be little impact upon the area.

Option 7 – Management of runoff around Finch Lane and Herkomer Road

Summary Description of Option

1. Incorporation of several runoff management options to limit the total volume of surface water which reaches the Homefield Road area.
2. Disconnection of roof runoff to limit the amount of surface water entering the surface water sewer system during low order events.
3. Highway management to increase the volume of water which can be stored within the highway.
4. Small improvements to the sewer system along Herkomer Road to reduce the chance of exceedance.

Summary Advantages of Option

- Reduces flow entering the downstream surface water sewer network.
- Combination of small-scale actions, less reliance on one action.
- Area-wide management scheme.

Summary Disadvantages of Option

- Will not be entirely effective during high return period events.
- Changes to the sewer system will result in potential disruption to road services during construction.
- Has no amenity benefits.
- Raising of kerb levels is often unpopular due to parking limitations.

Summary of Option Viability and Deliverability

The built-up area surrounding Herkomer Road has many flow paths that transfer water into the Homefield Road area whereby there have been several incidents of flooding reported. This area should be approached as a ‘risk area’ and managed as a whole to result in overall reduction of surface water. The area is highly developed with little

green space to provide natural storage options and so a more-engineering approach is required. This option provides some viable benefit, however will only have a notable impact when combined to have an overall effect.