Three Rivers Options Long List

Long List of Options

TRDC2a - Eastbury / Northwood

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 River Moor Park Stream. Limiting the maintenance along the watercourse would result in decreasing channel capacity (through increased vegetation growth) and blockage of culverts and bridges. Within the hotspot, the watercourse is culverted below Batchworth Lane, which if it were to become partially/fully blocked, would result in upstream flooding. Stalling maintenance of the sewer system, including gullies, would further increased flood risk through reducing capacity in the system.	N/A	Yes
Do minimum	Do minimum	Continue with current operational and maintenance activities	Continued maintenance will ensure no deterioration of Moor Park Stream and operation of existing assets. However, this option will not provide any betterment to the existing scenario and will remain as per the existing situation	3	Yes
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. However, increased maintenance of the sewer	N/A	No

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			system should be considered, as clearing of gullies would increase capacity for surface water.		
Option 1	Investigation of potential buried watercourse	A potential buried watercourse lies across Fairway Gardens	Identification of this watercourse could potentially highlight an additional flow path that could be connected into the surface water network.	2	No
Option 2	Attenuation Areas	Incorporating attenuation basins along flow path routes reduce the extent of flooding downstream. e.g. Recreation ground at Ross Way, Land adjacent to the Railway	An attenuation area within the green space around Ross Way would store the water which currently ponds along Batchworth Lane. This is not directly the within natural topographic flow route and consideration of how flows enter the attenuation would be required. Attenuation areas could also be incorporated around the railway embankment near the western boundary of the hotspot. Here there is extensive green space which would provide an ideal area to store some of the water associated with the flow path (along the embankment) as well as any flooding associated with the Moor Park Stream.	3	Yes
Option 3	Increased conveyance and temporary storage of water within the highway	Additional temporary storage within the highway could reduce flooding downstream through the reduction of flood volumes along key flow paths	Storage junctions could be implemented into several roads e.g. Batchworth Lane and adjoining side roads, however discussion with the HCC highways team would be required.	2	No
Option 4	Retrofitting of SuDS	Disconnect direct runoff from existing roofs and roads from public sewers and route it via SuDS before re-connecting	Re-routing of surface water into rain gardens, with raised verges in places, would result in increased storage and divert water away from property driveways and entrances. Retrofitting requires extensive construction works and there can be spatial constraints for the incorporation of SuDS.	4	Yes

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		to public sewers.	Opportunities for SuDS are found in several places across the hotspot. A large volume of the major flow path within the hotspot originates along the roads Orion Way, Avior Drive and Altair Way before reaching Batchworth Lane. In this area there are several larger parcels of green space which could be utilized to contain some of this water to reduce the amount that reaches Batchworth Lane. This flow path leaves the highway (along Batchworth Lane) and flows through multiple side streets. These include Ardross Avenue, Eastbury Road and St Mary's Avenue. All of these roads have grassed areas along the roadside which provide idea areas to incorporate storage areas that would intercept the flow path. It is here that the majority of flood incidents have been recorded.		
Option 5	Connection to sewer network		There is opportunity to connect the flow path parallel to Batchworth Lane into the existing sewer system. The nearby system does have capacity, however at the downstream end there is surcharging occurring. Further consideration would be required. This would also require discussion with Thames Water.	2	No
Option 6	Property flood resilience	Protection to individual properties (e.g. via air brick covers, door guards etc.). Areas including: Altair Way, Oryon Way, Ardross Avenue, Eastbury Road, St Mary's Avenue and	The flood depths shown to occur, within the modelling, around the at-risk areas, are typically low and so installation of property flood resilience may be a viable option. 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. The majority of properties which have recorded flood incidents within this hotspot	3	Yes

Long list option	Option measure	Description	Option considerations	Viability Score (1 – Low viability, 5 – High viability)	Take Forward to short list?
		Batchworth Lane	are affected by the flow path which flows south parallel to Batchworth Lane. The depths associated with this flow path are shallow (up to 0.4m during the 1 in 75-year flood event), suggesting that property flood resilience could be considered here. However, alternative methods of reducing the volumes of the flow path should be considered initially, to also limit the level of protection required. Overall, as the depths are low, the cost of this method as a flood risk mitigation method, is likely to outweigh the flood risk posed to the properties.		

Table 1: Viability scoring criteria

Assessment Criteria		Do Minimum	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Construction & Maintenance	Disruption for construction and maintenance are minimised	5	2	4	2	4	2	3
Design Capabilities	Number of properties protected from flooding by surface water runoff	0	2	4	2	3	4	2
	Level of additional environmental benefit provided	0	1	3	1	4	1	1
Health & Safety	Risk to maintenance operatives is minimised	5	2	3	2	3	2	4
Public Acceptability	Overall acceptability of the scheme to the public	3	3	4	3	4	3	4
Natural Environment & Visual Amenity	No adverse ecological effect on flora and fauna	5	3	4	2	5	2	4
	Scheme minimises visual impact on surrounding area	5	1	4	2	5	3	4
Climate Change Adaptation	Design can be easily adapted to accommodate climate change impacts	0	1	2	1	1	1	3
Cost	Low capital investment required	5	2	3	3	3	2	3
	Low maintenance costs	5	2	3	2	3	2	4
	Total (out of 50)	**33**	**19**	**34**	**20**	**35**	**22**	**32**
	Viability Score (out of 5)	**3**	**2**	**3**	**2**	**4**	**2**	**3**

Scoring Criteria *Please Note: All options are ranked comparatively*	0 = Does Not Meet Criteria 5 = Fully Meets Criteria

Short list of Options taken forward:

- **Do nothing**
- **Do minimum**
- **Option 2 – Attenuation areas**
- **Option 4 – Retrofitting of SuDS**
- **Option 6 – Property flood resilience**

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 Eastbury 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 number of properties in the area. This will not prevent future increases 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.		
Properties at Risk from Flooding in Baseline Do-minimum Scenario			
Very Significant Risk (>5% AEP)	Significant Risk (Between 5% and 1.3% AEP)	Moderate Risk (Between 1.3% and 0.5% AEP)	Low Risk (< 0.5% AEP)
Number of Residential Properties at Risk from Flooding			
142	65	6	90
Number of Commercial Properties at Risk from Flooding			
18	6	2	20

Option 2 – Attenuation areas

Summary Description of Option
1. Utilisation of the wooded area around the railway embankment (west of Rofant Way) to capture flows associated with the flow path. 2. The area will be adopted as a detention area during times of high flow. 3. Will also capture any flood volumes associated with the Moor Park Stream.

Summary Advantages of Option
• Reduces flow entering the downstream public sewer network. • Can provide a good standard of protection. • Opportunities for environmental enhancement and/or habitat creation. • Construction/ operation works do not affect individual properties.

Summary Disadvantages of Option
• Relatively high capital costs. • More rigorous maintenance requirements (public safety issues, visual impact, etc.). • Large land area required. • Residual risk of overtopping or failure.

Summary of Option Viability and Deliverability
Storage areas are a proven solution for alleviating flood risk. The area around the railway is currently a small area of woodland in which he flow path exists. The option can be viable but in terms of deliverability the main challenges will be negotiating and compensating affected landowners, groundwater conditions, existing services and ensuring access to works area can be provided

Option 4 – Retrofitting of SuDS

Summary Description of Option
1. Utilisation of small areas of green space within the built up as areas of storage. 2. There are many grassed spaces between roads and pavements which could be used to intercept flow paths along the highway. 3. Whereby extended parcels of grass are present, swales could be excavated to both store and convey water.

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
• Increased maintenance may be required, as a result of additional greenspaces, dependent upon existing regime. • Retrofitting of SuDS may result in a loss of amenity space.

Summary of Option Viability and Deliverability
The area is highly developed and opportunity to incorporate SuDS into existing greenspace should be taken. The greatest opportunity and most impact would be achieved in the roads surrounding Avior Drive. Here there are larger areas of greenspace. However, the small areas along Batchworth Lane and the side roads should also be adopted as areas of storage as there is a clear flood risk here.

Option 6 – Property Flood Resilience

Summary Description of Option
Passive 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 is required to ensure full potential of protection is achieved.

Summary of Option Viability and Deliverability
PFR remains a viable option but should be considered as an alternative should no other capital scheme be viable. Deliverability will be subject to the outcomes of a PFR survey and resident consultations.

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