Appendix D

Potential Environmental Impacts and Proposed Mitigations

Discipline	Sensitive Receptors	Key Impacts (positive and negative)	Proposed Mitigation
Nature Conservation	**Statutorily Protected species and habitats** Hedgerows	- Severance of over 50 hedgerows, including at least three which are considered important under the Hedgerow Regulations.	Creation of new species rich hedgerows. Restoration of existing hedgerows by filling gaps and promoting suitable management techniques.
	Himalayan Balsam	- Himalayan Balsam present along Scalford Brook and Thorpe Brook, with the potential to be spread to other watercourses, through construction activities.	Implementation of strict biosecurity protocols.
	Freshwater Invertebrates (TBC)		
	Fish (TBC) – including Bullhead	- Loss of and degradation to habitats supporting notable species and assemblages.	Best practice measures to minimise habitat degradation, e.g. through pollution or shading.
	Great Crested Newt (to date confirmed in Ponds 4, 22, 24 and 29)	- Loss of and degradation to habitats supporting notable species and assemblages.	Creation and restoration of connecting freshwater habitats to enhance freshwater invertebrate assemblages.
	Grass Snake	- Habitat loss, fragmentation, loss of foraging and resting habitat, impact on pond water levels, potential injury and killing of a European protected species	Best practice measures to minimise habitat degradation, e.g. through pollution or shading.
	Wintering Birds	- Loss and degradation of habitats to the north of Melton Mowbray Country Park.	Creation and restoration of connecting freshwater habitats to enhance and secure long term viability of fish populations.
	Breeding Birds	- Possibility of injury during construction works to the north of Melton Mowbray Country Park.	
	Barn Owl	- Loss of overwintering foraging habitats for farmland passerines, e.g. stubble/set-aside.	EPSM licence for great crested newts, habitat restoration measures, creation of new terrestrial habitat and ponds, hibernacula, log piles, enhancement of existing habitat, maintain habitat connectivity creation of new terrestrial habitat and ponds, hibernacula, log piles, enhancement of existing habitat, maintain habitat connectivity.
	Bats – roosting (TBC)	- Loss of hedgerow and arable farmland nesting and foraging habitats.	
	Bats – foraging (TBC	- Loss of non-breeding roost site.	
		- Loss of roost sites (recorded within the main farm building at Sysonbury Farm)	
	Badger	- Severance and loss of foraging and commuting routes and habitats. - Increased risk of predation through lighting. - Risk of mortality at points where commuting routes cross the new road	Management of redundant agricultural areas within the redline boundary to allow for creation of suitable overwinter foraging opportunities, such as game cover strips, set-aside margins, etc.

	Water Vole Otter	- Possible loss of two setts within the footprint scheme. - Creation of a barrier within existing territories, leading to the potential for mortality from traffic collisions. - Possible loss of and degradation to habitats used by Water Vole. - Potential disturbance to resting/breeding site. - Potential disturbance to resting sites, habitat modification, habitat loss, impact on water levels/cause of flooding and subsequently causing killing and injury to otter.	management and creation of hedgerows to promote biodiversity. Management of redundant agricultural areas to allow creation of floristically diverse grasslands, to provide invertebrate prey during spring/summer. Creation of artificial roost site, e.g. box located within suitable buildings or tree. EPSM license for bats, creation of new roosts. Potential green infrastructure and well-designed soft landscaping to maintain connectivity and steer bats away from zones where traffic collisions are possible. Sensitive lighting to avoid illuminating foraging areas or light spill into habitats used by bats. Avoidance and retention of setts in the first instance, but if this cannot be avoided then sett closure under license, with the creation of artificial setts at suitable locations away from the scheme. Habitat restoration, habitat creation and enhancement. Habitat restoration (EPSM disturbance licence), habitat creation and enhancement, otter ledges in culverts/bridges.
	Statutorily Protected Sites (SSSI) River Eye SSSI	-Direct loss of habitat, habitat degradation and detrimental changes in river hydrology.	Detailed mitigation, compensation and enhancement delivered across the wider SSSI, including restoration to promote natural river processes, habitat creation to improve quality status and species assemblages and wider control of management processes where possible.
	Other designated sites (Wildlife Sites, nature reserves, BAP) Melton Mowbray Country Park LWS	- Potential for degradation to habitats within the LWS. - Potential for degradation to habitats	Best practice measures to minimise habitat degradation, e.g. through pollution or shading. Best practice measures to minimise

	Scalford Brook LWS	within the LWS.	habitat degradation, e.g. through pollution or shading.
Air Quality	Residential properties and other non-residential potentially sensitive receptors including educational buildings and the River Eye SSSI	+ Reduction in pollutant concentrations through the centre of Melton Mowbray - Increase in pollutant concentrations along the extent of the scheme No overall significant effect anticipated for air quality	None proposed for operational phase. Standard best practice dust mitigation measures proposed for the construction phase.
Cultural Heritage	Designated heritage assets (Scheduled Monuments and listed buildings) Buried archaeological features Buried paleo-archaeological/environmental deposits in the River Eye valley.	-Negative impacts on the setting of designated heritage assets. - Direct physical impacts on buried archaeological features. - Loss of paleo-archaeological/environmental deposits.	Consideration of detailed design elements (eg signage and street furniture) to limit potential impacts on the setting of designated assets. Archaeological evaluation to identify the potential for archaeological features along the route. Detailed archaeological excavation will be required in areas were archaeological features are identified. Use of Ground Investigation results and specialist paleo- archaeological/ environmental analysis to record the deposits prior to any impact.
Landscape & Visual	Landscape Character Area (LCA) 6: Ridge and Valley; LCA 11: Pastoral Farmland; LCA 13: Eye Valley; LCA 16: Farmland Patchwork; and LCA 17: Open Arable; LCA 20: Melton Fringe / LCA 21: Melton (taken from Melton Landscape Character Assessment) Residential properties in Melton Mowbray (approx. 600m west); Residential properties in Thorpe Arnold (approx. 200m west); Residential properties in Burton Lazars (approx. 500m south); Residential properties in Brentingby and Wyfordby (nearest approx. 1km east); Other individual	Loss of rural characteristics such as agricultural land and hedgerows – negative impact Addition of highway, moving traffic and urbanising infrastructure within rural fringe of Melton Mowbray – negative impact Reduction of perceived tranquillity within rural fringe of Melton Mowbray – negative impact Effect of additional lighting in the rural environment – negative impact Addition of the proposed development and moving traffic to residential views across rural countryside in Burton Lazars and Thorpe Arnold as well as the northern and eastern edges of Melton Mowbray – negative impact Addition of the proposed development and moving traffic to recreational views across rural countryside from within Melton Country Park, on National Cycle	Reinstatement or realignment of hedgerows where possible, with a view to maintaining and reinforcing the existing field pattern. Landscape mitigation design to consider landscape character within design decisions. Limit lighting to that which is absolutely necessary, particularly in the more rural parts of the study area. Design lighting so that there is minimal light spill. Screening planting where appropriate in terms of visual mitigation and landscape character (ie not planting screening vegetation in a wide open landscape).

	isolated residential properties; Users of National Cycle Route 64 (crosses the proposed development); Users of various local rights of way; Users of Twinlakes Park (approx. 200m north-east); Users of Melton Country Park (approx. 200m north-east); Transitional receptors on the A606 (crosses the proposed development); Transitional receptors on the A607 (crosses the proposed development); Transitional receptors on the B676 (crosses the proposed development); Transitional receptors on the Leicester-Peterborough railway line (crosses the proposed development); Transitional receptors on minor roads; and Workers on and users of the Saxby Road Industrial Estate (approx. 1km west).	Route 64, and on various local public rights of way – negative impact Reduced traffic levels within views in the centre of Melton Mowbray – positive impact	
Geology & Soils	Human Receptors (future road users, residents and workers of nearby properties); Controlled Waters (underlying groundwater aquifers, Surface watercourses e.g. River Eye and Scalford Brook); Development Infrastructure (MMDR, bridges and other associated structures); Agricultural Land and Soil Quality	(-) Low likelihood of disturbance and release of potentially contaminated soil; (-) Low risk of pollution to groundwater and surface watercourses; (-) Low risk of chemical attack on foundations by potential aggressive ground conditions; (-) Loss of minimal **Best and Most Versatile** agricultural land	Carrying out an intrusive investigation to assess the potential contamination risk; Developing and complying with a site specific Construction Environmental Management Plan (CEMP); Complying with the following guidance documents: DEFRA's 2009 Code of Practice for sustainable use and management of soils on construction sites; CIRIA C692 (2010) Environmental Good Practice on Site; and Pollution Prevention measures; Controlling surface water run-off using appropriate drainage measures.

Climate Change Adaptation [1]	Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	+ Reduced pavement deterioration from less exposure to freezing, snow and ice[2]	Update winter maintenance plans Regular monitoring and maintenance of pavement materials
	Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	+ Reduced need for snow clearing	Update winter maintenance plans
	Social receptors (i.e. local communities/business or road users)	- Health and safety risks to road users (e.g. from brake failure) and employees	Suitable Personal Protective Equipment Education of road users regarding appropriate vehicle maintenance
	Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- Inaccessible networks and assets	Identification of suitable network redundancies Strategic deployment of critical resources with suitable training
	River Eye Surrounding ecosystems and biodiversity Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- 'Summer Ice': After a prolonged period of no rain when dirt and oil residue builds up on the road. When the first rain event occurs this material becomes incredibly slippery and dangerous (similar to ice on the road)	Road user warning systems in place Regular maintenance of drainage systems Cleansing of the network where appropriate.
	Surrounding ecosystems and biodiversity Social receptors (i.e. local communities/business or road users)	- Signs, tall structures and high-sided vehicles at risk from increasing wind speeds	Road user warning systems in place Effective vegetation maintenance Regular surveys, management and

[1] Key impacts have been chosen to be the ones assessed with "High" Magnitude (Likelihood x Severity) during any of the 30-year period (2020s, 2050s or 2080s).

[2] Positive impacts have been marked with "+" as well as negative impacts have been marked with "-".

	Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)		monitoring of street furniture such as street lighting to ensure asset stability.
	Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- Reduced safety as a result of standing water	Road user warning systems in place Regular maintenance of drainage systems Emergency preparedness plans to be in place.
	River Eye Surrounding ecosystems and biodiversity Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- Increasing ice/snow melt leading to flooding	Road user warning systems in place Ensure effective, essential winter maintenance. Emergency preparedness plans to be in place.
	Social receptors (i.e. local communities/business or road users)	- Safety risks due to snow and ice	
	Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- Reduced pavement friction coefficient	Road user warning systems in place A high friction surface coating will likely be required on lengths of carriageway leading up to junctions and pedestrian crossings.
	River Eye Surrounding ecosystems and biodiversity Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- Increased debris and mud flow onto roads	Road user warning systems in place Regular maintenance of drainage systems Regular road sweeping and cleansing.

	River Eye Surrounding ecosystems and biodiversity Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- Increased slope instability and landslides leading to subsidence	Road user warning systems in place Requirement for regular slope stability/ geotechnical surveys Emergency preparedness plans to be in place Identification of suitable network redundancies
	River Eye Surrounding ecosystems and biodiversity Social receptors (i.e. local communities/business or road users) Road assets and their operation, maintenance and refurbishment (i.e. pavements, structures, technology etc.)	- Damage to roads and drainage systems due to flooding	Regular monitoring of drainage systems (potential use for CCTV etc.) Regular maintenance of drainage systems Emergency preparedness plans to be in place
Climate Change Mitigation (GHG Assessment)	Global Climate (UK carbon inventory and Carbon Budgets used as proxy)	+ Reduction in GHG emissions from vehicles on traffic model area in operational stage Emissions from: -Vehicles and fuel use for generators on site in enabling works and construction activity -Workers travelling to and from the site of the Proposed Scheme -Loss of carbon sink from land clearance -Embodied GHG emissions in construction products - Disposal of any waste generated by the construction processes - Embodied emissions associated with maintenance and re-surfacing materials	A CEMP (construction environmental management plan) prepared and implemented by the selected construction contractor to include a range of best practice construction measures Specification of alternative materials with lower embodied GHG emissions and locally sourced where feasible Low carbon design specifications such as energy-efficient lighting and durable construction materials to reduce maintenance and replacement cycles
Sustainable Travel	Local residents Motorised Travellers (road users) Non-Motorised Users	**-** Journey times and traffic congestion (construction) **-** Diversions or closures to footpaths and Public Rights of Way (construction) **+** Journey times and traffic congestion (operation)	Use of clear signposting for Motorised Travellers and Non-Motorised Users both during construction (to inform of diversions) and operation (to identify new routes).

		- Temporary closures to footpaths and Public Rights of Way (operation)	
Community Severance	Local residents Motorised Travellers (road users) Non-Motorised Users (NMUs) Community and Private Assets (e.g. community facilities, services, dwellings) Open Spaces and Agricultural Lands	- Journey times and traffic congestion (construction) - Views and visual impacts (construction) - Diversions or closures to footpaths and Public Rights of Way (construction) - Air Quality and Noise effects on NMUs (construction) - Disruption to / Loss of Open Spaces (construction) - Disruption to / Loss of Agricultural Land (construction) + Journey times and traffic congestion (operation) 0 Views and visual impacts (operation) 0 Closures to footpaths and Public Rights of Way (operation) 0 Air Quality and Noise effects on NMUs (operation) 0 Disruption to / Loss of Open Spaces (operation) - Disruption to / Loss of Agricultural Land (operation)	Use of clear signposting for Motorised Travellers and Non-Motorised Users both during construction (to inform of diversions) and operation (to identify new routes). Replacement of any open spaces which are permanently lost and enhancement of any which are temporarily required during construction. Use of appropriate Air Quality and Noise measures. Mitigation in relation to effects experienced in relation to Air Quality and Noise is expected to be incorporated within the scheme as far as possible. Re-provision of any community or private assets which are permanently lost, or appropriate compensation measures (to be determined by the applicant)
Health	Human Health and Wellbeing, as experienced by Local Residents	0 Access to open space and nature 0 Air Quality, Noise, and Neighbourhood Amenity + Accessibility and Active Travel 0 Crime Reduction and Community Safety + Access to Work and Training + Social Cohesion and Lifetime Neighbourhoods 0 Minimising the use of Resources 0 Climate Change	Use of appropriate Air Quality and Noise measures. Mitigation in relation to effects experienced in relation to Air Quality and Noise will be incorporated within the scheme as far as possible. No further mitigation required. Options to enhance the benefits of the scheme in relation to human health will be explored and outlined within the Health Assessment.
Water Resources (inc flood risk)	River Eye SSSI (Very high importance)	+ Re-meandering of the River Eye where it had been historically straightened for the abandoned canal.	• Consultation with regulators and landowners. • Environmental surveys, designs and assessment.

	Scalford Brook, lakes in Melton Mowbray Country Park, and Thorpe Brook (High importance) Minor watercourses, lakes and ponds, and groundwater (Medium to low importance) Areas of fluvial flood risk either side of major watercourses	+ Improved river and floodplain habitats, for biodiversity and amenity, in keeping with meeting WFD objectives and supporting meeting favourable conservation status of the SSSI. + Natural flood management. + Realignment and daylighting of ordinary watercourse adjacent to Lag Lane and upsizing of the existing undersized culvert known to cause highway flooding. + The proposed River Eye realignment is unlikely to adversely impact flood risk to any residential properties since there are none located in the immediate vicinity. The river section to be realigned is currently surrounded by greenfield. - Potential impacts on water quality, both surface and groundwater, due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals, or through mobilisation of contamination following disturbance of contaminated ground or groundwater, or through uncontrolled site run-off. - New discharges of highway runoff to watercourses that may include dissolved and particulate pollutants (e.g. metals, hydrocarbons, particulates, de-icant salts etc.). - Potential increase in volume and rate of surface water runoff from new impervious areas leading to an impact on flood risk. - The construction of a new bridge across the River Eye, although offset by the removal of the shorter existing Lag Lane structure, will result in land take within the floodplain due to new embankments, potential changes in flood levels and flows, shading of the channel, loss of habitat, and a risk of scouring of the river bed and banks. - The construction of two new bridges across the Scalford Brook and the Thorpe Brook will result in land take within the floodplain due to new embankments, potential changes in flood levels and	• Increased habitat areas. • Improved flood storage. • Removal of the Lag Lane bridge which currently acts as a constriction to offset impact of new larger span structure. • Brentingby Dam defends Melton Mowbray against flooding from River Eye. The proposed MMDR is located downstream of Brentingby Dam. • Provision of flood relief culverts under the proposed highway embankment to reduce afflux upstream of the proposed bridge on River Eye. • Flood compensation storage for loss of flood plain. • Proposed highway drainage network and attenuation ponds will be designed so as to not increase surface water flood risk from the proposed scheme to adjacent areas. • Construction phase mitigation measures to manage works to avoid, minimise and reduce the risk of water pollution or the physical damage to water bodies. • Proposed highway drainage network and attenuation ponds will be designed to provide treatment of runoff and to provide a way that large chemical spillages can be retained within the highway drainage network.

		flows, shading of the channel, loss of habitat, and a risk of scouring of the river bed and banks. - Permanent loss of channel from three new culverts across Ordinary Watercourses.	
Noise & Vibration	Residential properties and other non-residential potentially sensitive receptors including educational, medical and community buildings.	+ reduction in traffic noise levels through the centre of Melton Mowbray - increase in traffic noise levels along the extent of the scheme, significant adverse effects anticipated at a number of individual properties, parts of Thorpe Arnold and edges of Melton Mowbray.	Low noise surfacing within the scheme extents Noise barriers where feasible; subject to engineering and landscape constraints.

Limitations

- The assessment presented in the table is based on information currently available at the time at writing. A full assessment of the proposed scheme will be undertaken and reported in the Environmental Statement.
- In-use emissions impacts have been taken from the WebTag air quality modelling that was produced for the Business Case.
- As construction data is yet to be finalised, GHG emissions from construction phases are in pre-assessment stage. Therefore, potential impacts and general mitigation measures have been estimated on a qualitative basis using professional judgement
- We have not had a decision from LCC on operational noise mitigation.
- Unable to say anything specific beyond normal best practice for construction noise; need contractor input.
- Work is ongoing and decisions need to be made which will influence the scheme design, assess impacts and inform mitigation measures.

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