Application by Highways England for an Order Granting Development Consent for A57 Link Roads

Deadline 4 - response on behalf of High Peak Borough Council

Responses from High Peak Borough Council are provided in red to outstanding matters discussed in the hearing session held during the week commencing 7th February 2022.

Please note that responses in relation noise will be submitted for deadline 5 on 23rd February.

Item 7 – Air Quality

Questions R, T, U, V, X, Y &

Question (r) 7.2. Applicant Climate change implications for air quality What regard has been given to the potential for climate change to influence emissions modelling and the air quality assessment?

Response

The assessment of air quality has been undertaken in accordance with the DMRB standard LA 105 which does not require a consideration of the potential for climate change to influence emissions and air quality, and consequently the potential effect of climate change on air quality has not been included in the air quality assessment for this Scheme. Modelling future air quality is inherently uncertain, as noted in section 5.4 of Chapter 5 of the ES (APP-061), not least in part due to the use of historical meteorological data to estimate future concentrations for an opening year. Climate change is expected to affect meteorology with a likely reduced frequency of poor air quality in winter, but an increase of periods of poorer air quality in summer due to increased summer temperatures and increased solar radiation. Changes are expected to vary regionally across the UK. However, the potential effects from climate change are expected over a much longer term than the timeframe for the air quality assessment and will generally affect secondary pollutants with a longer atmospheric lifetime rather than nitrogen dioxide (NO2) which has a lifetime of less than a day. The air quality assessment considers effects on sensitive receptors in the opening year (2025) of the Scheme as a worst case, as vehicle emissions and background concentrations of nitrogen dioxide are expected to reduce in future years, as a result of the switch to low and zero tailpipe emission vehicles. The potential effects from climate change are likely to be most apparent after the year of opening, with any changes in concentrations arising from climate change effects outweighed by the future reductions in vehicle emissions. Additionally, the air quality assessment is based on a gap analysis scenario following the method in DMRB LA105 to ensure the future modelled NO2 concentrations are not too optimistic. The air quality assessment for the opening year of 2025 can still be considered to be a worst case. In any case, any effect from climate change would be similar both without and with Scheme and as such the outcome of the air quality assessment would not be expected to change.

The Applicant [REP2-021 Q7.2] considers that adverse changes would be outweighed by a beneficial shift to electric vehicles.

r) Are the local authorities satisfied that is a reasonable approach?

It is agreed that the standard AQ assessments do not tend to directly include possible climate change effects on future air quality emissions at receptors. This is essentially because of the inherent difficulty in predicting the future meteorological changes due to climate change.

It is certainly correct to say that future NO2 emissions from vehicles should reduce overtime as society switches to less polluting vehicles. However, how this would translate into any effects on air quality experienced by receptors emissions, due to addition changes in meteorological conditions (as a result of climate change) can only be postulated.

T) 7.3 a)

The dispersion modelling within the assessment has been undertaken in line with the methodology given in the Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management Technical Guidance (LAQM.TG16)

Complex terrain can have an effect on air pollutant dispersion; however, it is ordinarily only considered when modelling point sources rather than road sources, for which it is widely considered unnecessary where there is a less than 10% gradient in slopes (Defra LAQM.TG16 para 7.452). In addition, the nature of air quality modelling for road sources, whereby the receptor points are ordinarily at roadside locations, largely negates any need to consider terrain given the nature of the environment whereby receptor and source are in such close proximity. Given the large air quality study area and the limited number of locations where gradient could affect road traffic emissions, it was therefore considered more pragmatic to address terrain effects through adjustment at specific locations rather than modelling explicitly across the study area. The gradient effect on vehicle emissions has been calculated using the latest available tools at the time of the assessment (Defra Emission Factor Toolkit (EFT) v10.1) and adjustment factors applied to the National Highways speed-band emissions to reflect the gradient effects at specific locations where the road gradient was estimated to be 6% or more:

• Glossop Road at the Dinting Vale junction.

• Mottram Moor and A6018 Back Moor between Carrhouse Lane and A6018 Roe Cross Road.

• A6018 Roe Cross Road either side of the junction with Edge Lane.

The method has included verification of the results of the dispersion modelling by comparison with monitoring data to ensure that final modelled concentrations are representative of the monitoring in the local area. Where there are differences greater than 25% between the modelled and monitored concentrations at many sites, or where there is a systematic bias in the comparison then model adjustment is undertaken. This can either be through revisiting model assumptions or adjustment of the model to bring results in line with real world data. Adjustment has been undertaken for “localised model validation zones”, i.e. the model area has been split into a number of individual zones to allow localised factors to be accounted for within each zone. The “localised model validation zones” include the sections of roads where gradient effects were accounted for in the emissions calculations as adjustment was still required to further bring the modelling results in line with real world data.

Are the local authorities satisfied with the consideration of terrain, including for heavy duty vehicles travelling uphill?

Not at this time. It is consider that the response focusses on the terrain rather than road gradient which are not the same.

Terrain

The effects of “terrain” on emissions is mainly considered during the initial dispersion model step up and essentially this is done to account for the possible influence of terrain on air flow/ movement. Consequently, it tends to be more relevant to evaluating point source emissions, rather than roads and can include nearby tall buildings etc that may affect this air movement.

It is accepted therefore that in the “setting up” of the model, a value of 10% gradient in slopes is acceptable (Defra LAQM.TG16), however this is not the primary concern.

Gradient:

The applicant notes that the gradient effect on vehicle emissions (rather than the dispersion effect in the model noted above) has been calculated using the Defra Emission Factor Toolkit (EFT) v10.1 , however this has only been applied at 3 locations where the gradient is considered to be 6% or more)

It is not clear where this 6% screening value was derived from & screening value as, the Defra Emission Factor Toolkit (EFT) v10.1 allows input of road gradients between 0-6%

Further, reference to the technical guidance above (LAQM.TG16) includes many sections noting the impacts of gradients on emissions, including a section on modelling road gradients (e.g Defra LAQM.TG16 para 7.447 – 7.449) which would indicate that all roads above 2.5% gradient should be considered e.g “7.436 …..road-traffic emissions on roads with significant gradient (>2.5%) can increase significantly (especially exhaust emissions from HDVs), as the engine power demand for vehicles going can increase significantly”.

Further clarification on the consideration of road gradients on vehicle emissions is sought.

u) High Peak Borough Council [REP2-053 Q7.6] raised concerns about modelling and methodology. The Applicant [REP3-021 pages 29 to 33] responded at Deadline 3.

Baseline conditions & model verification Verification against multiple datasets – justification

Although multiple monitoring datasets have been used in model verification the Applicant does not agree that it inherently affects the reliability of the model.

Given the size of the air quality model study area it was essential to reference several monitoring datasets to provide a suitable number of monitoring sites for model verification in each geographical area.

Where there were multiple sites from different surveys in the same location these were carefully considered as to which site was both, most representative of base year concentrations at relevant receptor locations, and which data was most reliable considering the data capture, year of collection and knowledge of specific siting.

Hierarchy – explanation & Clarification of data used Monitoring data used in model verification has been adjusted to 2018 (the year used for air quality model verification) using the annualisation method described in Defra Local Air Quality Management Technical guidance (LAQM.TG.16, Feb 2018 (the current version at the time of the assessment)).

Table A-5 in Appendix 5.3 of the ES (APP-157) provides a list of all sites used within the verification process.

As stated, the air quality monitoring data for 2018 used for air quality model verification has come from a number of sources:

• For sites operated by local authorities these are the actual data for 2018 (no annualisation).

• For historic scheme specific surveys (undertaken in 2015 and 2016) data was projected forwards to 2018 (referred to as the MMLR and M60J24J27 surveys)

• The most recent scheme specific survey (referred to as the TPU survey) started in July 2018 and was extended to include additional sites in August 2019 (and continued until the end of December 2021).

2019 monitoring comprised a complete year of data, so monitoring for 2019 was projected back to 2018 to be used in verification.

The 2019 data projected back to 2018 was used in preference to the data collected in 2018, which was for a maximum of 5 months, for all TPU sites. The latter point highlighted by HPBC refers only to the use of MMLR data in preference to TPU survey data.

No MMLR survey data was used in the verification in preference to HPBC data. 2018 vs 2019

The projection of the scheme specific survey data back from 2019 to 2018 did result in some sites with a lower concentration in 2018 than 2019. This is considered in Chapter 5 of the ES (REP2-006) paragraph 5.6.19.

The scheme specific survey data presented in Chapter 5 of the ES (REP2-006) are only for sites adjacent to road links that met the traffic screening criteria in National Highways DMRB LA105 air quality guidance (those within the air quality study area).

The sites included are a sub set of those in the full survey. When comparing the survey period mean (2019) to the calculated annualised and adjusted 2018 annual mean the following resulted in the lower 2018 annual mean:

- Background CMS sites used in the adjustment measured higher actual annual mean concentrations in 2019 than in 2018.

This is also true of all background CMS sites in the Greater Manchester area.

- The resulting factor to adjust from 2019 to 2018 are thus less than 1, which makes the 2018 concentrations lower
- Sites did not typically have 100% data capture, which affected the factor applied to adjust to 2018.
- 2018 concentrations are time weighted (i.e. each concentration is multiplied by the time the tubes were out) as the DEFRA's calendar has not been completely followed, which is the recommended approach in Defra Local Air Quality Management Technical guidance (LAQM.TG.16, Feb 2018).

This approach might also result in lower concentrations at certain locations (especially if they have low data capture).

Modelling future air quality is inherently uncertain, as noted in section 5.4 of Chapter 5 of the ES (REP2-006), not least in part due to the use of historical meteorological data to estimate future concentrations for an opening year. As shown in background CMS monitoring within the Greater Manchester area (GMCA 2019 Air Quality Annual Status Report), 2018

represented a meteorological year which resulted in lower annul mean background NO2 concentrations than long term national trends would predict.

It is important to account for this in the 2018 back projected scheme specific survey data otherwise modelled future concentrations would be overly conservative. Although all the 2018 and 2019 data does not fit the general downward trend in NO2 concentrations, this does not negate the long-term national trend in background concentration reduction or predicted improvement in future vehicle emissions, as a result of the switch to low and zero tailpipe emission vehicles.

Dinting Junction data analysis Table A-5 in Appendix 5.3 of the ES (APP-157) provides a list of the monitoring sites not included in the verification and the reason for the exclusion including where sites in the same or similar location were excluded in preference to other survey data. As stated HP25 was excluded in preference to TPU17 (the closest TPU site to HP25) given the exact height of TPU17 was known and monitoring data for the TPU17 site was in line with other sites in the zone, whereas HP25 was not.

When monthly data for HP25 was reviewed it was noted that includes a June 2018 concentration which was double the average concentration of all other months (110.9 µg/m3). No other diffusion tube in the HPDC survey appear to have an abnormally high result for June 2018. This potentially erroneous data was taken into consideration and given TPU data was monitored in triplicate the annual mean concentration for TPU17 was considered to be more reliable.

Model improvement before verification. The method has included verification of the results of the dispersion modelling by comparison with monitoring data to ensure that final modelled concentrations are representative of the monitoring in the local area.

Where there are differences greater than 25% between the modelled and monitored concentrations at many sites, or where there is a systematic bias in the comparison then model adjustment is undertaken.

As stated, this can either be through revisiting model assumptions or adjustment of the model to bring results in line with real world data. Model assumptions were revisited prior to the final model verification and adjustment process.

This included:

- Detailed checks on traffic data and speed band selection. the air quality study area for the Scheme to confirm they were suitable to use in the assessment without adjustment.
- Review of suitability of monitoring data for inclusion in model verification.
- Checks of annualisation methodology and bias adjustment applied to raw monitoring data.
- Confirmation, as far as possible, of the exact location of monitoring sites used in model verification to ensure geographical representation of road sources and monitoring sites was as accurate as possible in the model.
- Consideration of the inclusion of street canyons in the model.
- The inclusion of factored emission rates to account for road gradients greater than 6%.

Adjustment was subsequently undertaken for “localised model validation zones”, i.e. the model area has been split into a number of individual zones to allow localised factors to be accounted for within each zone.

The “localised model validation zones” include the sections of roads where gradient effects were accounted for in the emissions calculations as adjustment was still required to further bring the modelling results in line with real world data.

RMSE The RMSE for the pre and post adjustment of the nine localised model validation zones are provided in the table below.

All zones have a post adjustment RMSE below the overall model RMSE of 4.81µg/m3 with the exception of zone 5 Mottram North of A57 and zone 7 Mottram Rise. Zone 7 Mottram Rise has an RMSE just above the overall model RMSE of 4.88µg/m3 however, zone 5 Mottram North of A57 has a higher RMSE of 7.75µg/m3 .

Although an RMSE of less than 4µg/m3 is ideal, the Defra Local Air Quality Management Technical guidance (LAQM.TG.16, April 2021) states that an RMSE that is less than 25% of the objective being assessed, in this case 10µg/m3 , is acceptable.

A57	14.69	4.32 2
A628	12.05	4.72 3
Dinting Vale Junction	21.41	1.98

Except for Air Quality Management Areas, does High Peak Borough Council have any outstanding concerns regarding the air quality modelling and assessment methodology?

Yes: The response from the applicant is considered detailed and will take further time to fully consider however the following queries are noted

- The comment that the applicant does not believe that multiple data sources with varying adjustments applied is unlikely to affect model uncertainty is noted though the scientific basis for this argument is not clear.

- The response to the use of back annualised data is noted, as is the reference to the methodology (e.g. LAQM.TG.16).

  The definition of annualisation within LAQM is to “estimate annual mean concentrations based on short-term monitoring results” rather than for “back” annualisation. Could the applicant expand on the applicability of this methodology, or a reference to it being previously /used accepted , as no reference to its use could be found within LAQM.TG.16

- Could examples be provided of the results obtained for relevant receptor locations in High Peak (the same locations) between the 4 different data sources: e.g projected forward results (2015/2016 data); High Peak monitoring results; 2018 “annualised” results and 2019 back annualised results, to demonstrate that they are all similar in their predictions.

- The applicant states that Model assumptions were revisited after the initial run gave an RMS of 37% (target is 10%) prior to the final model verification and adjustment process.

  They then state that:

  "Adjustment was subsequently undertaken for "localised model validation zones", i.e. the model area has been split into a number of individual zones to allow localised factors to be accounted for within each zone. The "localised model validation zones" include the sections of roads where gradient effects were accounted for in the emissions calculations as adjustment was still required to further bring the modelling results in line with real world data".

  It is still not entirely clear if the actual model set up was checked/ altered in each of the localised zones or the only difference between the initial model run and the "model zones" was the splitting up of the model based on location and application of the 6% emission factor gradient at 3 locations(*see previous response on gradients*)

  Can the applicant clarify?.

V} High Peak Borough Council [REP2-046 and REP2-053 Q7.8] raised concerns about screening. The Applicant [REP3-021 page 20] responded at Deadline 3.

v) Does High Peak Borough Council have any outstanding concerns regarding the screening? **See table below**

z) Do the local authorities have any general comments on provisions for dust mitigation and monitoring in the plan? Does it provide enough detail at this stage?

aa) Please could the local authorities provide written comments on the plan for Deadline 5, on Wednesday **23 February 2022?**

Comments on the applicant's response to our Local Impact Report is relation to air quality are provided below.

Response Reference	Comments
8.33	Response is accepted
8.34	Response is noted and the ES Chapter 5 update will include an assessment at these receptors which will be submitted at Deadline 3.
8.35 (v)	Response is noted. The 'trace of the scheme' is taken to be the scheme itself. The eastern end of the link road, where it connects to Woolley Bridge, is located within HPBC and there are receptors located within 200m. Therefore potential air quality effects at these properties maybe experienced during the construction phase due to the movement of construction vehicles. Can it be confirmed what level of traffic is expected in this location and for what duration.

8.36 (v)	Response is noted. However, further clarification on whether the increase in traffic is likely to result in an adverse effect on congestion in HPBC is requested.
8.37 aa	Response is noted and that the EA Chapter 5 will be updated and resubmitted at Deadline 3. However, clarification on whether dust monitoring (beyond visual means e.g. using ambient or depositional/soiling techniques) will be established at high risk sites is still required.
8.38 aa	Response is accepted with regards the details of dust control measures being set out in the EMP Nuisance Management Plan which will form an annex od the EMP (second iteration). The response however does not cover the second part of the issue, 'Qualifying features for the compliance assessment and receptors considered in the local air quality assessment along the A57 Brookfield are expected to show a large increase in NO2 concentrations in the opening year. The qualifying features for the compliance assessment are not labelled on Figure 5.4'
8.39	The application of no adjustment of the modelled Defra background concentrations will result in a conservative approach at receptors which are predicted to experience a deterioration in concentration. However, the concern is that at receptors which are predicted to experience a beneficial effect due to the scheme the beneficial effect will be overestimated.
8.40	It is understood that the traffic data was screened against the DMRB LA 105 criteria to define the ARN, which does not include the AQMAs in Glossop or Tintwistle. However, the reason for the concern is that relevant exposure i.e. residential dwellings are located in close proximity to the road and therefore emission source. In these environments a change in traffic flow/composition, below the DMRB LA 105 criteria, could result in a perception change in concentrations which could contribute to the determination of significance.
8.41	Further information is sought for the rationale for this diversion onto Shaw Lane and Dinting Road and whether in reality HGVs as well as light vehicles will use this diversion is required. This is required to provide confidence that roadside receptors along the A57 won't be impacted if this counterintuitive diversion does not occur.
8.43	Response is noted.
8.44	Response is accepted
8.45	Response is accepted

Item 8 – Other Specific Issues

Local social and economic impacts

Derbyshire County Council [REP2-045] identify potential added benefits for the scheme were it to deliver active travel routes for school routes through industrial estates (Paragraph 15.15).

i) How would these routes be secured and delivered?

In 2020, High Peak Borough Council developed a draft version of the Glossop Gateway Masterplan. An extract of the draft masterplan is submitted to the examining authority with this response for information. The masterplan is intended to reinforce positive impacts arising from the A57 Link Roads project whilst helping to address any residual negative impacts. It includes a package of measures designed to attract additional investment and generate further economic activities along the A57 corridor, as well as to deliver improvements to the "Glossop Gateway". The objectives of the masterplan are to:

- Promote the delivery of planned growth in the area and enhance business rate growth;
- Unlock housing and employment growth, providing more certainty to developers of local residential schemes;
- Identify proposals to address residual effects of the A57 Link Roads which may affect local quality of life, the environment, health and wellbeing;
- Manage local environmental and connectivity improvements by ensuring that new development is framed by high quality green and active travel infrastructure;
- Support the delivery of other Glossop and Hadfield town centre benefits; and
- Guide balanced and sustainable development

In terms of active travel routes, the masterplan identifies a current lack of options for east – west travel. It goes on to state that; "*Increased traffic flow through Glossop is also likely to result in delays to pedestrians crossing the main vehicular routes through the town (i.e. severance). As such, an assessment of pedestrian crossing facilities (and an assessment of the type of equipment, to ensure delays to pedestrians and vehicles are minimised) is likely to be needed. There may also be other environmental impacts of traffic on pedestrians that would need to be considered once the updated traffic flows are available, including intimidation (particularly if there are large negative changes in HGV traffic), noise, and air quality."*

However, it is noted that the scheme does not consider such matters in detail or propose any mitigation in Glossop and Hadfield.

The draft masterplan seeks to establish a "green arc" – an access and ecological corridor along the Glossop Brook and River Etherow. This would provide a continuous walking and cycling route between Glossop town centre through to Wooley Bridge and Hadfield linking communities with facilities and employment and connecting up with the Trans-Pennine Trail and Pennine Bridleway.

Work on the masterplan was paused in 2020. This was in part due to the lack of published data regarding the impacts of the A57 Link Roads scheme at the time. It is intended to re-visit the masterplan in 2022.

The Borough Council and other stakeholders are also supporting an active travel project led by a local community group – Move More Glossop. The project seeks to create a compact and connected town that reduces the need for travel by car and encourages walking and

active travel with a view to delivering health, social, environmental and economic outcomes. The proposed routes broadly aligns with the ”green arc” of the Glossop gateway masterplan with the addition of a spur to Glossopdale School .

Once the masterplan is finalised, an implementation and delivery plan will be developed, identifying a set of key projects that will help deliver. Outline business case proposals for projects that will enhance green infrastructure, pedestrian, cycle and horse-riding connectivity and sustainable travel opportunities in the area may also be developed. Funding sources will also be identified. One potential source of funding is National Highways Designated Funds. The Borough Council has had initial discussions with National Highways regarding the scope for a future bid.

6.5: Green Infrastructure

Green Infrastructure (GI) is a term that collectively describes the network of natural and semi-natural features within and between our villages and towns. These vary in scale from street trees, green roofs and private gardens to parks, rivers and woodland; as well as larger elements such as agricultural land. GI is increasingly seen as vital to biodiversity, climate change adaptation, human health and wellbeing. Protection and enhancement of GI is now provided through local and national planning policy and should be considered at all design stages. GI is also about quality of life and making places attractive for people to live, work and play: encouraging active travel and providing joined-up opportunities for formal and informal recreation.

Opportunities to enhance GI within the area could include the following (Figure 6.5):

- Avoid the of loss of natural habitats in the first instance, with enhanced mitigation where this is not possible. Proposals should link with other surrounding habitats as a priority, expanding and enlarging the habitat network;
- Provision of accessible green spaces as an integral part of developments;
- Consider how new development will link to existing pedestrian and cycle routes, encouraging easy car-free access to transport hubs, recreational and community facilities;
- 'Filling the gaps' in the Pennine Bridleway, which is used by local and tourists, e.g. providing diversions away from busy roads such as Glossop Road in Gamesley or around the Etherow Industrial Estate;
- Creation of continuous walking or cycling routes along Dinting Vale, alongside the Glossop Brook;
- To provide a better, safer route alignment for the Trans Pennine Trail, including providing missing links and removing on-road sections where possible; and
- Improved management plans for woodland and grasslands, to enhance biodiversity value and; along with access and interpretation that encourages residents to experience nature.

Precedent images

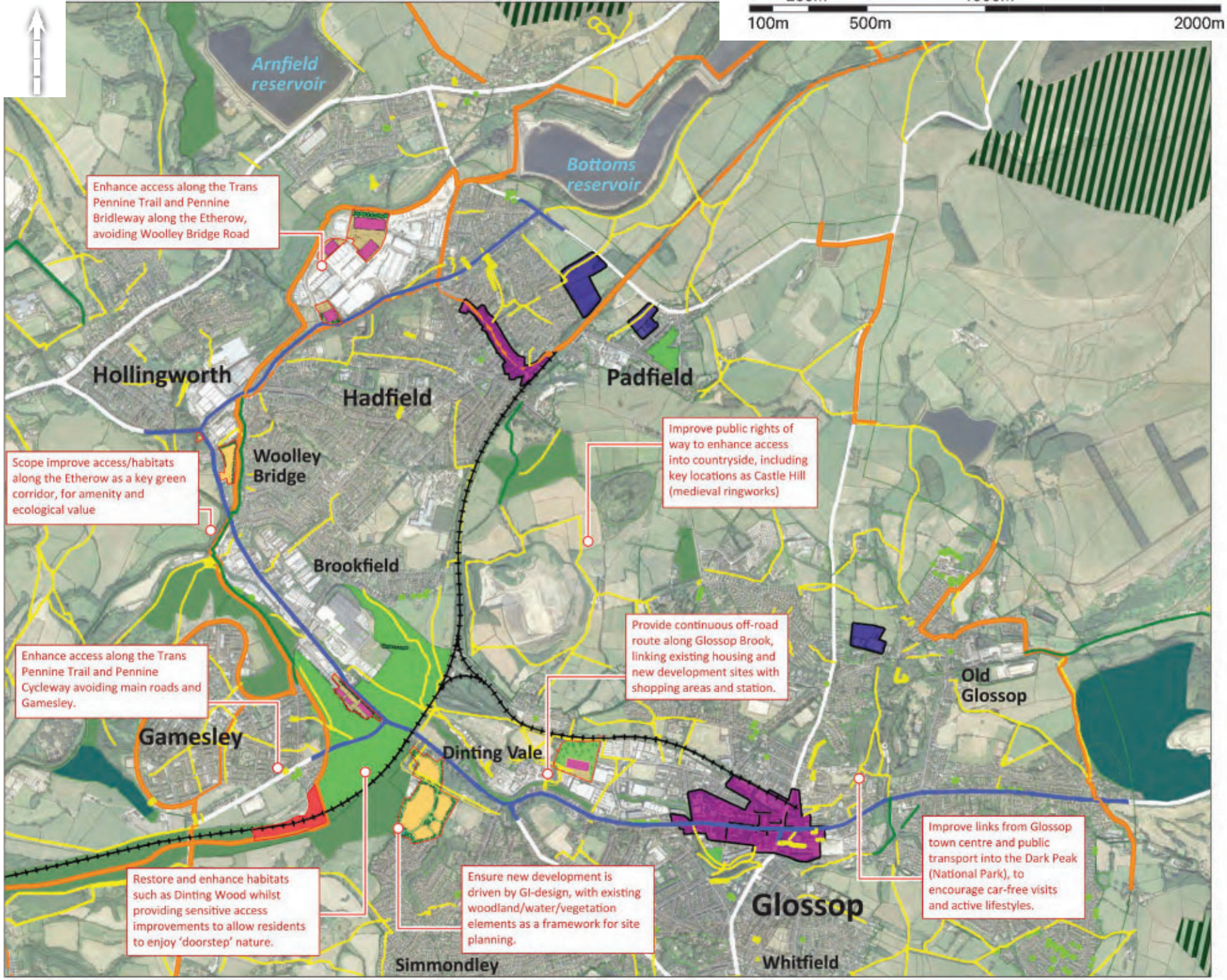

Figure 6.5: Overarching Green Infrastructure Plan

6.6: Placemaking/Character Areas

The study area is endowed with a unique character: steep hills rising to dramatic moorland; wooded valleys; stone buildings and Victorian architecture. Maintaining and enhancing this distinctive identity is a crucial part of the masterplan process. New development should build on these qualities, creating communities with distinct identities that encourage a sense of ownership and pride for those that live, work and play there. Placemaking is a fundamental part of this process.

Key, high-level placemaking concepts for the study area include (Figure 6.6):

- Provision of gateway features for positive 'first impressions' at key entrances or junctions. These could reflect specific local qualities or features, such views of the Dinting Viaduct in the west or the Dark Peak fringe to the east;
- Enhancement of walking and cycling corridors, particularly along watercourses, creating legible, attractive, welcoming routes and 'walkable' communities. These could also tie in with improvements to sections of the Pennine Bridleway and Trans Pennine Trail, benefiting both local residents and visitors and encouraging the latter to stay longer or travel more frequently;
- Use of local materials and planting to reinforce the special character of the area and proximity to the Dark Peak. These could include gritstone for walls, bridges and buildings; use of drystone walls or mixed species hedges rather than fencing; and native species that also provide biodiversity and habitat benefits;
- Provision of green spaces and pocket parks as an integral part of developments, to reinforce community identity and offer benefits for mental and physical health, encouraging better accessible connections with nature 'on the doorstep'; and
- Integrated water management, incorporating Sustainable Drainage Systems (SuDS) as a driver in the masterplan process. These would include swales, permeable paving and rain gardens that reduce flood risk but also provide attractive planted areas, particularly where large hardstanding or floorplates form part of industrial and commercial land uses.

Precedent images

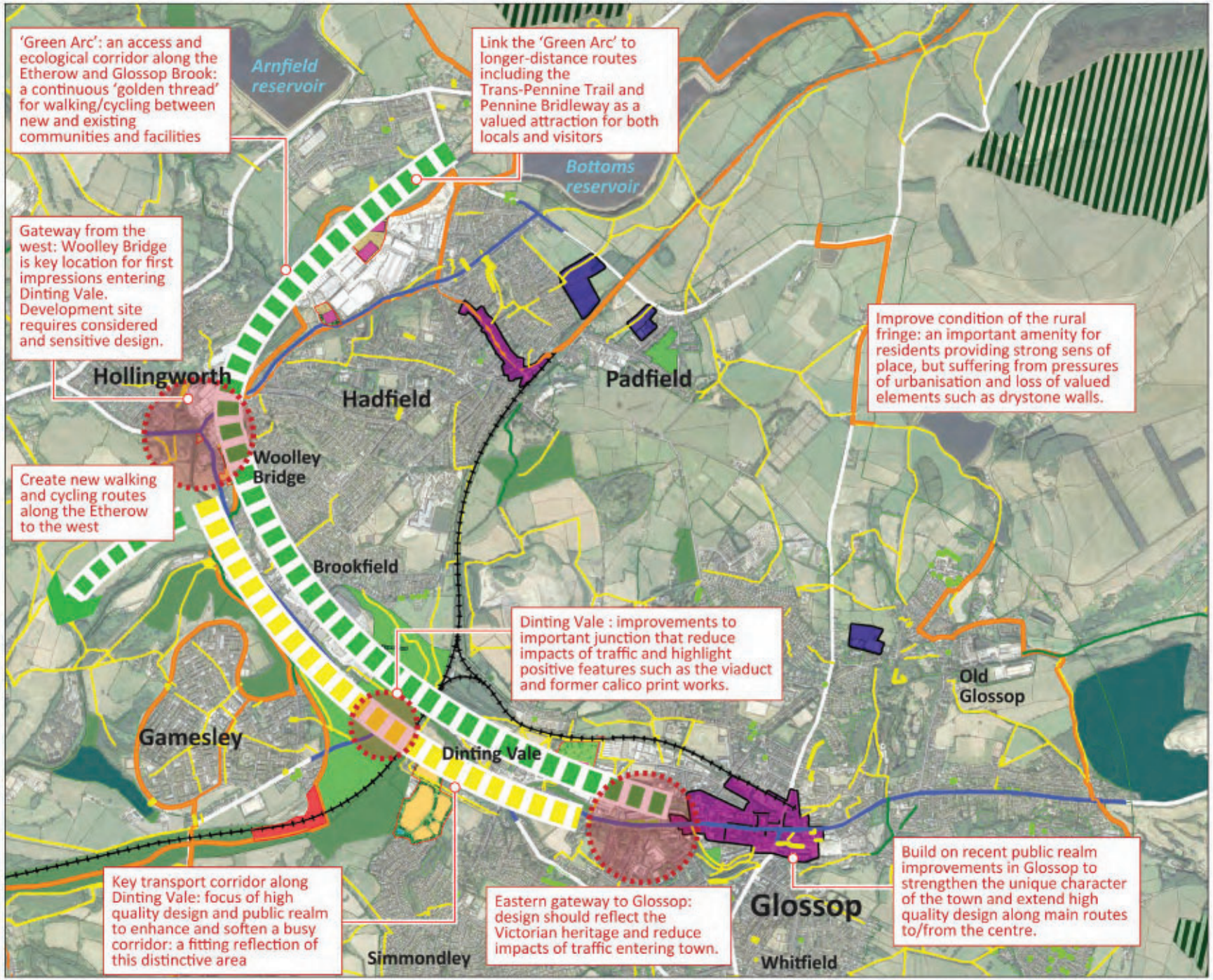

Figure 6.6: Overarching Placemaking Plan