

Street Tree Appraisal Report

Resurfacing roads and footways whilst retaining street trees



December 2021

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1. BACKGROUND

The Sheffield Highways PFI contract commenced in August 2012 and was awarded to Amey Hallam Highway Limited (AHHL) with Amey Local Government Limited (ALG) appointed as the Sub Contractor (service provider) to deliver the performance requirement through the early investment stages (2012 to 2017) and maintenance period, 2017 to 2037 of the 25-year PFI contract.

During the early investment stage trees were identified and approved for replacement, however due to significant opposition, the highway improvement programme was suspended on several streets, leading to mediated talks with all parties to explore alternatives to the replacement of trees causing damage to the highway. The early investment stage was concluded in April 2018 with 309 trees over 78 streets subject to ongoing relaxation of standards to allow further investigation and alternatives to be considered.

The mediated talks, involving Amey, Sheffield City Council and Sheffield Tree Action Group (STAG), concluded with all parties committed to a joint position statement.

The status of the 309 individual trees across the 78 streets is summarised below and is deemed to be an accurate position as of 30th June 2021. Therefore, it is an interim position whilst recommendations are considered and approved by Sheffield City Council:

Status of the individual trees

Key	Definition	Number	
		Trees	%
	Replacement status cancelled	163	53%
	Refer to Options Review 2021	142	46%
	Tree felled due to condition or other safety issue	4	1%
	Total	309	100%

Note: 'Replacement Status Cancelled' is the job/status raised in the Streets Ahead Management Information System during the early investment stages. The decision to fell and replace the individual tree has been cancelled.

Status at street level

Key	Definition	Number		Comments
		Streets	% Streets	
1	<p>Closed: defects around trees have been repaired and resurfacing has been completed</p> <p>Replacement status – cancelled (tree retained)</p>	33	42%	<p>Cruise Road is closed. The tree was felled to a stem in 2017 and has been replaced</p> <p>Myrtle Road is closed. One tree failed due to being windblown</p>
2	<p>Programmed: defects around trees have been repaired and resurfacing is to take place</p> <p>Replacement status – cancelled (tree retained)</p>	12	15%	Some minor outstanding repair or remedial work around trees may still be outstanding, which will be delivered by the surfacing teams on site
3	Referred to Options Review 2021	33	42%	Some minor work or ‘make safe’ repairs may have already been undertaken around these trees
Total		78	100%	

In summary, streets considered closed or programmed, where defects have been addressed, equate to 57% of the initial streets where trees are now retained.

2. INTRODUCTION

The following section looks at each street, providing options and associated recommendations developed through:

- visual inspections of each street and tree to reassess the initial highway defects previously identified;
- experience gained during the joint investigations with STAG in 2019/20 and associated lessons learnt
- the work carried out in 2020 on several high-profile streets where the carriageway and footway resurfacing were concluded and achieved through agreement with Sheffield City Council to alternatives in materials, variations to the street itself and compromise to contract standards all accepted on a case-by-case basis.

Each street has been investigated, not limited to those street trees identified in the early investment stage of the contract, to ensure a consistent approach, taking into consideration the above, and the aims of the new Sheffield Street Tree Strategy which are:

- potential third-party damage which may lead to future claims, where known;
- design constraints of any remedies considered such as drainage, creating water to pond in proximity to constructed buildouts, impact on parking or other local factors;
- the considered life expectancy of the street trees to ensure the investment of any remedy is balanced with the tree's long-term prognosis. If trees are identified for replacement an individual tree report will be produced in accordance with Appendix 5 of the [Sheffield Street Tree Strategy](#) approved March 2021;
- the potential cost of remedial work, design, and build, for any proposed changes to the highway network;
- consultation in accordance with Appendix 5 of the Street Tree Strategy via Citizen Space where trees are identified for replacement, and where significant changes to the highway are likely to have an impact on the resident and highway user. Consultation through Citizen Space will be undertaken by Sheffield City Council. Local roadshows will be held by Amey Area Highway Representatives to highlight the impact on the street and signpost to the relevant consultation pages.

The report only considers the known streets which were subject to the tree dispute during the early investment stage. Any streets identified in the future will be addressed on an individual basis by Amey in collaboration with Sheffield City Council.

The safety and serviceability responsibilities on all streets and the proposed solutions will be retained by Amey LG as the service provider and sub-contractor. The aim of the report is to provide options and recommendations to retain the street trees previously identified for replacement.

To achieve this, the recommendations may include, seeking the approval of Sheffield City Council for the relaxation of, or a compromise to, standards set out in the Contract.

The guiding principle applied is to seek long term solutions that maintain the tree and ensure that the infrastructure is safe and in a maintainable condition for the future and for residents to minimise where reasonably practicable, ongoing, and costly repeat maintenance visits.

Please refer to Appendix One for examples of buildouts, lining solutions and the use of alternative materials already used on Western Road, Meersbrook Park Road and Rundle Road.

Annual Investment Programme 2021/22

The Annual Investment Programme (AIP) provides the current streets identified for improvement works, including surfacing of carriageways and footways for this current year, which is available online.

Report Updates

The options appraisal reflects the current status of the streets and individual trees up to the 13th of September 2021, which may be subject in future to further change, whilst the 78 streets remain a live concern this report will be kept up to date were works remain ongoing. Those streets where improvement works have been completed will be closed and monitored in accordance with Street Ahead obligations and those set out in the Street Tree Partnership Strategy.

3. FINDINGS & RECOMMENDATIONS

The following provides a summary by street as set out below:

- Issues;
- Options;
- Recommendations.

3.1 Albany Road

Issues

- Remedial works have been undertaken previously replacing several kerbstones with edgings and the construction of tree pits in the footway;
- Surfacing of the carriageway and footways has been complete in part only; the remainder outstanding due to nature of the remedial works undertaken to date being considered a compromise to required standards.



- The photo on the left shows a 25m section of the footway up to the road junction which to date has not been resurfaced;
-

- The photo on the top right is the tree located adjacent to a speed cushion. Narrow edging has been installed to replace previously missing kerbs;
- The photo on the bottom right shows' edgings installed in place of kerbs.

Options

- Regarding the tree located adjacent to the speed cushion, the edgings are effective and currently there is no evidence of movement, therefore no further action is required apart from continuing to monitor through regular inspections;
- Further investigation is required on the other tree (see bottom right) due to potential rooting into the carriageway and to prevent damage to tree roots during any resurfacing work. The likely depth and intrusion into carriageway may result in minor deviation of kerb line with a lining solution or a build out to be considered;
- Tree pits to be constructed in the footway where required followed by footway resurfacing (photo on the left).

Recommendations

Whilst the use of edgings is considered a temporary measure, there is no evidence of movement to date, therefore recommend accepting a compromise to contract standards to be agreed which may apply to both trees. The aim is to minimise disturbance of the other tree, to identify root intrusion into the carriageway and implement an acceptable solution based on previous experience and good practice.

The footway requires several tree pits to be constructed followed by resurfacing to conclude the outstanding work.

3.2 Aldam Road

Issues

- Several carriageway defects exist which to date have prevent the conclusion of the required resurfacing work;
- Those previously identified outside 37 and 25 have been addressed, though footways remain outstanding.



- Photo on the left outside property 22: tree buttress roots have displaced the kerbs with a significant root between the kerbs extending into the carriageway. The remaining kerbs have been absorbed by the tree.
 - Photo on the right outside property 25: the defects associated with the kerb line have been concluded previously, however the footway has been narrowed and surface is uneven and in poor condition due to the tree roots.
-

Options

- The options available to address the displaced kerbs and rooting into the carriageway are limited as removing the existing kerbs is likely to result in significant damage to the tree which is in a fair condition overall;
- Therefore, the option is limited to the installation of a built out, 600mm in width. Bollards are not considered to be a requirement, therefore minimising impact on the street scene;
- The footway requires 60mm reconstruction throughout the length of the street and in proximity to the trees, hand excavation is required. Regarding the tree outside 25, removing historic asphalt patching will enable the new surface to be laid to rectify the ramping, but in retaining the tree there is a compromise to the current width of the footway where no restrictions exist on the footway on the opposite side of the street.

Recommendations

To ensure the trees are retained and a permanent solution implemented, the construction of a build out is recommended, accepting that for the tree outside 25, a reduction in footway width will be required.



3.3 Aldfield Way

Issues

- Aldfield Way is a residential street with a single lane carriageway and one mature tree located in the footway. The footway width has been compromised by the tree, with no safe passage between the tree and its' boundary to the stem, and there is ramping of the footway due tree roots;
- The carriageway and footway resurfacing works have been completed and remain in good condition.



- The photo on the left shows the location of the tree and its' impact on the footway;
- The photo on the right shows the impact of the tree with several kerbs missing and narrowing of the footway.

Options

- Remove and replace the tree, though a suitable location for a replacement tree on the street is limited. This is the only tree in the street and is therefore significant to the local landscape;
-

- The tree and restriction of the footway is historic therefore residents are familiar with the condition and restrictions it poses. One option is to take no action and retain as is. The current kerb upstand allows people to cross the road without being impeded. It is a narrow, residential street, with low footfall and traffic with good visibility along the length of the road. There are no immediate drop crossings opposite, but they are located along the opposite side of the road at vehicle crossing points;
- Road safety view (June 2021): as a historical layout with a single isolated tree, with alternative crossing points at Edensor and Fairbank Roads available with a low upstand on the kerbs, the road is accessible for impaired highway users. Therefore, the recommendation is to retain the tree with no alterations to the highway required;
- Consider a drop crossing either side of the tree, with tactile paving, creating a tree pit around the tree, removing asphalt surfacing and de-accrual a section of the footway (approximately 4m) to remove future liability and risk.

Recommendations

As per the road safety view quoted above, as a historical layout with a single isolated tree, with alternative crossing points at Edensor and Fairbank Roads available with a low upstand on the kerbs, the road is accessible for impaired highway users. Therefore, the recommendation is to retain the tree with no alterations to the highway required.

3.4 Banner Cross Road

Issues

- Nine (9) trees were identified for replacement due to missing kerbs, evidence of rooting in the carriageway, with footway surfacing lifted creating uneven and ramped surfaces. Trees were identified for replacement to enable defects to be addressed;
 - Improvement work including resurfacing is planned for 2021. Defects associated with two (2) trees have been addressed previously, and in addition the tree located outside property 106 was removed in April 2021 following a routine tree inspection due to disease *Meripilus*.
-

Therefore, several defects remain to be addressed to enable the resurfacing work to proceed as shown in the photos below:



- The photos show the extent of the damage to the footway including displacement of kerbs, and kerbs which are missing, replaced by the tree stem and buttress roots. There is clear evidence of roots extending from several trees into the carriageway which will need to be investigated further. Based on current experience this is unlikely to exceed 500mm;
- Two trees are located at the junction with Ecclesall Road South. Both have displaced and missing kerbs with pedestrian barriers in place due to the extent of damage on the footway. The other shows a missing kerb only;
- Damage from the remaining trees varies, from displaced kerb, to no kerbs at all and roots encroaching into the carriageway, with footway surface defects and ramping needing to be addressed;
- In addition to the defects listed above, the tree outside number 67 leans into the carriageway but there is no other defect present.

Options

- Options are limited on Banner Cross Road due to the maturity and size of the trees, their location in the footway, the kerb line and presence of roots extending into the carriageway which impact ability to resurface the road without damaging any roots present.

Recommendations

To address the current kerb defects and rooting as shown in the outline design drawing below:

- construct four (4) buildouts approximately 750mm in width;
- due to the width of the proposed buildout, bollards will be required;
- reposition the current highway gully to ensure the drainage system remains functional.

For the remaining two (2) trees where buildouts are not recommended, they can be retained using alternative materials, a relaxation of current standards, introducing the use thinner kerbs or edgings where feasible, minimising buildout and the impact on the junction with Ecclesall Road South.

Making changes to the highway by introducing four (4) buildouts will have an impact on residents and the highway user by reducing the availability of parking and changing the street scene.

Current layout and outline design drawing



3.5 Chippinghouse Road

Issues

- Previous remedial works have addressed several defects associated with the trees and the carriageway. However, there are two (2) trees where kerbs are displaced and there is rooting into the carriageway. The carriageway resurfacing remains outstanding;
- Footway resurfacing has been completed apart from the sections surrounding the remaining trees to be addressed;
- On the opposite side to the speed cushion a tree of similar scale exists where the displaced kerbs have been replaced with edgings. There is no sign of movement therefore no further action is considered necessary.



- Photo on the left outside property 181: the tree has displaced the kerbs with evidence of roots extending into the carriageway. The footway edgings are raised and footway surfacing around the tree has yet to be completed;
- Photo on the right outside the Butler Hotel: as above the footway remains outstanding in proximity to the tree. The tree has displaced the kerbs which are now missing and is located adjacent to the speed cushion section in the carriageway.

Options

- To conclude the footways, reconstruct and extend the existing tree pits around the remaining trees, hand excavating to enable reconstruction of the footway without damaging the trees and associated roots;
-

- The trees described above are located within the width of two asphalt raised speed cushions, therefore they should not impede the conclusion of the resurfacing. However, the speed cushions do require remedial work.

Therefore, there are two options available to address the missing kerbs adjacent to the two trees within the speed cushions:

- The tree buttress roots, and stem fill the gap of the kerb, therefore by way of compromise, leave the kerb out. It does not impede the resurfacing work and there will be no impact to the tree, therefore no excavation is required. Lining to be applied to the speed cushion to highlight the tree and missing kerbs similar to Rundle Road. It is a wide residential street with on street parking and considered low risk;
- Incorporate a build out of 600mm into the speed cushion, with reflective bollards and lining applied. However, this is only applicable on one side of each of the cushions. To ensure a consistent approach to the street scene for users, install a build out to both sides with reflective bollards, kerbs, and lining. This will increase the visibility and effectiveness of the cushions. However, these measures will restrict the availability of current on street parking and have a potential impact on drainage by removing the channel either side of the cushion, therefore gully placements will need to be reviewed.

Recommendations

Extend tree pits on the footways and resurfacing.

First option as above, accept the missing kerbs. It is a no cost option with no impact on the outstanding carriageway resurfacing and minimises the impact to residents and the current street scene.

3.6 Cliffefield Road

Issues

- The trees are in a narrow footway which runs adjacent to the rear of the properties. There is minor kerb displacement only. The key issue is the uneven footway due to roots, the narrowing of the footway conflicting with adjacent steps to a third-party property with implications on one tree, and another where there is significant water run-off into a third-party property and carriageway ponding that needs to be addressed.



- **Top photo:** shows a number of trees and the extent of the footway narrowing. However on the opposite side of the road there is safe passage for all users where access is restricted;
- **At the bottom left:** a narrow footway and adjacent access step to the third party property where there is a heightened risk for the footway users due to the restriction of the footway and its condition;
- **Bottom middle photo:** there is a significant gradient and profile of the footway which creates run-off of surface water into an adjacent property. The carriageway is also in a low spot where ponding occurs;
- **At the bottom right:** tree roots are evident across the footway causing an uneven surface and potentially restricting access to the driveway for the resident.

Options

Several options have been explored following recent inspections:

- Resurfacing the footway where access only is required, therefore limiting pedestrians to the footway on the opposite side of the street;
- Tree replacement to reinstate the footway for all users;

- A minimised programme of tree replacement to address the key issues highlighted above, with the footway resurfaced throughout providing pedestrians access to either side of the road.

Recommendations

Following recent inspections with various stakeholders including the Road Safety Team of Sheffield City Council, the recommendations are:

- The footway is to be resurfaced throughout, accepting the narrow width in places with best endeavours to reprofile the footway where possible to improve accessibility. However, accepting this may not create a footway available to all users, introduce a new crossing point prior to Cliffe View Road to allow users to cross to use the footway on the opposite side which has no trees or obstructions present;
- Replacement of the tree in the bottom left photo to allow the footway to be reconstructed, providing a greater and sufficient width to allow safe passage and avoid the third-party steps, reprofiling the surface of the footway to reduce surface water run off on to third party property;
- Replacement of the tree in the bottom middle photo to allow footway to be reprofiled, lower kerbs to reduce the surface water run-off into the neighbouring property where evidence on site indicates this to be significant;
- Bottom right photo: tree to be retained however with roots present in the vehicle cross point, on-site investigations need to be carried out to identify if the roots may be pruned;
- Tree report required to support the above recommendations and published in accordance with the New Street Tree Strategy, appendix 5.

3.7 Coverdale Road

Issues

- The footway has previously been resurfaced however several tree pits need to be extended due to current damage evident from roots with ongoing monitoring and inspections;
 - Carriageway resurfacing remains outstanding due to the tree outside number 3 which to date has remained unresolved.
-



- The above photo shows the tree outside number 3. The kerbs have been replaced with edgings previously but the footway is raised due to the tree. The key issue is that the tree leans into and encroaches over the carriageway by approximately 2m. The tree is in a fair condition with no visible defects.

Options

To address the tree's encroachment into the carriageway by way of it leaning, two options have been considered excluding tree replacement:

- The **first option** is to reinstate the kerbs using a thin kerb, either in concrete or natural stone;
 - The encroachment of the tree is addressed with signage and a lining solution to forewarn users of high sided vehicles travelling along the residential street. The risk will remain, though there is only evidence of historical strikes on the tree, nothing in recent times, therefore the risk could be low;
-

- Following a road safety review, this option is not considered to be appropriate at this location. There is a risk of leaf litter obscuring the lining, the severity of the tree's encroachment and the width of the carriageway.
- The **second option** is the construction of a build out into the carriageway to mitigate the risk of encroachment and vehicle strike, of approximately 600mm to 2m, ensuring the tree and highway users do not conflict in the future, and minimising its length to avoid the loss of parking;
- The footway will be addressed through hand excavation, reprofiling and tree pit construction.

Recommendations

The use of signage and lining is deemed unsatisfactory due to leaf litter obscuring the lining and the extent of signage required to make highway users aware of the tree's encroachment who may be unfamiliar with the street and the trees. Therefore, the introduction of a single built out will remove any future conflict and enable the outstanding resurfacing work to be concluded whilst preserving the tree.

3.8 Dunkeld Road

Issues

- Three (3) trees were identified for replacement due to kerb displacement and the extent of disruption and damage to the footway which could not be repaired with the trees in situ;
- The number of trees identified where defects exist has increased significantly to thirteen (13) where damage exists either on the carriageway or footway requiring remedial work or alternative action ahead of planned resurfacing work in 2021;
- Four (4) Dawn Redwoods are causing significant damage.

Planted in the 1990's, the Dawn Redwoods are well established on the street, in good form and with no visible defects present and now thriving in terms of growth rates. However, there is extensive damage to the footways, where pedestrian barriers have now been on site more than a year due to the risk to the public such as trip hazards associated with a raised footway,

exposed roots and around one tree, safe passage is difficult. The roots extend 4m to 5m along the channel on either side of the tree (see photo top right), with kerbs displaced or missing, the footway disrupted and difficult for users to use.



The key issue to address is the long-term implications and risk these trees present to the highway, road users and adjacent properties:

- The footway has been significantly impacted upon by the four (4) trees. This is likely to continue and compromise the width of the footway over time;
- To address the rooting into the carriageway, considering the future of the trees, buildouts will be required to provide sufficient scope for growth creating an alternative footway in the future which will protect the exposed roots;
- Therefore, to consider retention of the trees, buildouts will need to extend between the residential drop crossings up to 10m, impacting on parking. If this were further extended in the future, it may impede vehicle crossing points, therefore, the buildout will need to provide an alternative footway for users as the existing is already compromised. In the short term, some of the footway defects may be addressed through hand excavation, constructing tree pits, and installing a permeable surface.

Issues associated with other trees (not Dawn Redwoods):

- On the left: on the junction with Ecclesall Road South, a mature Plane tree is located with kerbs missing and buttress rooting encroaching into the carriageway. The footway is narrowed due to the tree and uneven due to root damage;
-

- On the right, there are a further six (6) trees causing damage. One of the six located outside 45 is a mature Ash tree. Other species include Alder, planted at a similar time as the Dawn Redwoods. The damage is significantly less but there is cracking and raised areas along the footway.



Options

Dawn Redwoods:

- **Option 1:** to create sufficient space for the trees to continue to thrive whilst providing safe passage for the highway user

To achieve this will require the creation of tree pits of sufficient scale, use of permeable surfacing, and build outs into the carriageway, wide enough to allow pedestrians to walk around the tree as the existing footway is reduced in width as the tree gains more girth. The roots are visible in the channel up to 4m-5m from the tree in both directions, therefore requiring the build outs to start and end at neighbouring property access points, impacting on the street scene, availability of parking and potentially current drainage.

- **Option 2:** remove and replace the trees, accepting a poor species selected for an urban street

The cost of the build outs themselves and for those properties adjacent to the trees, resulting in a loss of parking space, and the potential scale of the trees in future; ongoing remedial works to the highway and the potential risk of adjacent property damage.

Other tree related issues:

- Mature Plane tree locate on the junction with Ecclesall Road South:

Its encroachment into the carriageway could be resolved with a minor build out, splitting the current parking bay requiring a 600mm build out with bollards that would likely remove approximately one car length of parking at the junction. A detailed design and Road Safety Audit will be necessary to review the options due to proximity to the junction, but this could be mitigated by extending the current double yellow lines through the first parking bay.

The footway will require hand excavating so that it can be re-profiled allowing for an even surface to be laid using a permeable surface.

- Other trees including Ash tree outside number 45:

Undertake hand excavation around all trees to remove the current surface. Based on learning to date, the historic patches are overlays built up over time. The footway maybe re-profiled and remedied by extending the tree pit and potential use of permeable surfacing.

However, the Ash tree outside 45 is mature, will require an extensive tree pit and the footway is narrowed due to its' scale. The likelihood is that the tree has less than 5 years' remaining due to the presence of Ash Die Back (ADB), therefore as part of the consultation with residents, the recommendation is to replace the tree as part of the overall work on Dunkeld Road.

Recommendations

Consultation on replacing the four (4) Dawn Redwoods with residents and the partnership to explore alternative species which may be more appropriate for the street and aligned to the Street Tree Strategy.

Change to the highway network with the loss of parking at the junction of Ecclesall Road South to retain the mature Plane.

Potential use of permeable surfacing material on the footway.

Current layout and outline design drawing



3.9 Ecclesall Road

Issues

- Several trees have been addressed out of the eleven (11) originally identified for replacement in the early investment stages, with footway patches completed, tree pits constructed, and kerbs reinstated. However, within proximity to seven (7) trees along the road, defects remain with either missing kerbs, misalignment, or footway defects;

Photos below are a sample of the issues that remain outstanding:



- The photos are a sample of the current defects present along the road, including locations where several footway defects have previously been resolved. For example, by removal of the flagged footway surface and replaced with an asphalt surface in 2019 which is now cracking due to movement and presence of tree roots;
- The other issue is the width of the footway, which is significantly reduced by the trees in places, with pedestrians using the shop frontage in the far-right photo for safe passage. Whilst not currently of significant concern, however in the future it may become an issue as more premises expand the use of this area;
- Regarding the carriageway, several the displaced and missing kerbs could be reinstated. However, several kerbs need to be addressed as shown above, where many are out of alignment due to the trees. There are three locations where, due to the size of the buttress roots and stem within the kerb line, permanent solutions remain outstanding, and where either an asphalt patch was put in place or the kerb was left out altogether;
- The first running lane along Ecclesall Road is a bus lane, with a limited number of parking bays also in place, which impacts on the options available.

Options

In recognition of Ecclesall Road and its importance to the local economy as a principal shopping site, with a vibrant street scene and high footfall, and working with Sheffield City Council and in collaboration with local stakeholders, a holistic approach is required to develop a long-term strategic approach to the landscape of the street and its future tree management:

- One option for the footway is use of material to minimise the current patchwork of stone flags and asphalt, introducing a permeable surface to minimise surface cracking and maximise impact on the width of the footway;
 - Regarding missing kerbs displaced due to the trees and the bus lane, build outs are not considered an option. Therefore, through the detailed design process of any scheme alternatives need to be considered, with the bus lane and parking restrictions in place and the carriageway previously surfaced, this is not considered to be of significant risk though those kerbs highlighted as displaced, or out of alignment through recent inspection, are to be addressed.
-

Recommendations

Any immediate defects identified through inspections are to be addressed, through the relaxation of standards in material and acceptance of missing kerbs, providing the opportunity for Sheffield City Council to work with all stakeholders to consider a long-term strategic approach to the street scene and its' enhancement.

Following a routine tree condition survey, the tree outside 367 has been identified and assessed to be in significant decline and therefore recommended for replacement due to its condition. Consultation on its replacement began week commencing 12th July 2021.

3.10 Edgedale Road

Issues

- Eight (8) trees were original highlighted for replacement in the early investment stage, however seven (7) have been addressed by installing thinner kerbs and extending tree pits;
 - The one remaining Sycamore has been subject to significant investigation resulting in the asphalt surface being removed, approximately 9 tonnes in total, made up of historic overlays addressing defects as they appeared. Some minor root pruning has occurred, limited to minor fine roots. There are significant surface lateral roots present that could not be severed due to their size, proximity to the tree and the implications this would have on the tree's stability.
-



- Top photo: excavation of the footway in February 2019 revealed significant shallow rooting (red boxes indicate main areas). The red line indicates the limit of the adopted highway;
- Bottom photo: due to roots present in the footway, pedestrians are required to walk on the adjacent property to pass the tree.

Options

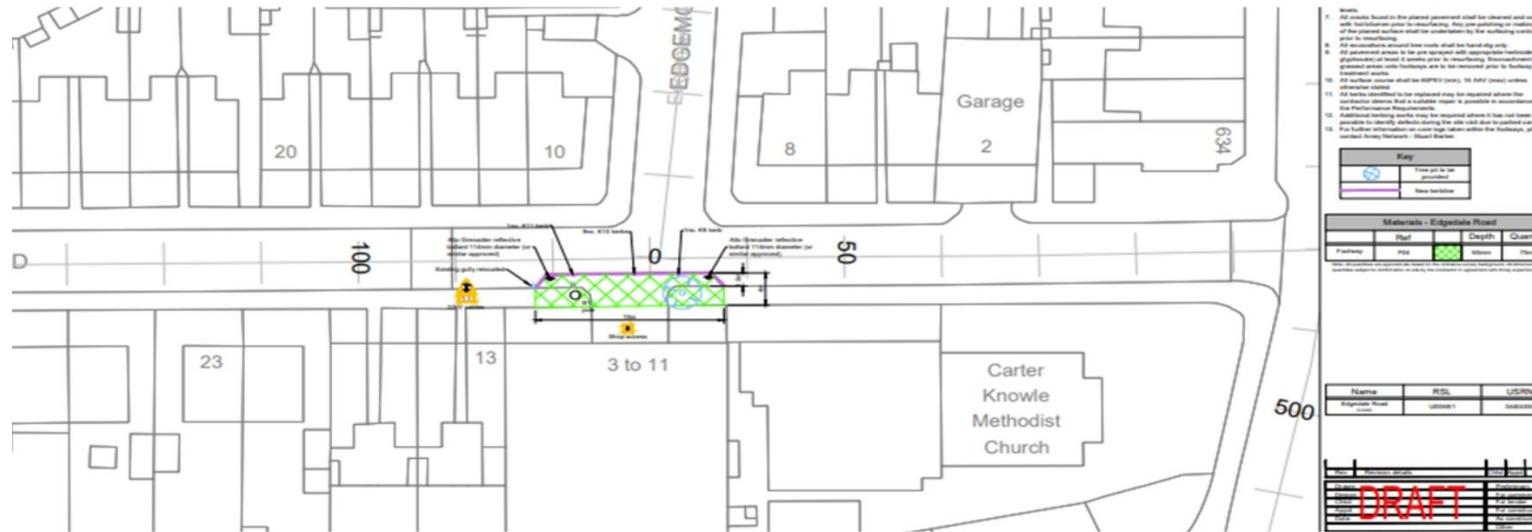
- Regarding the condition of the tree, no work is considered necessary at this time. There are no defects, and it is in good overall condition;
- Of principal concern is the condition of the footway, specifically the width to ensure safe passage for users. Possible options to rectify this are:
 - **No action:** allow users to continue to use the adjacent forecourt. However, this is used by the owner for parking, loading, and unloading materials and may not be always available. For this reason, it is not considered a feasible option. Current and future liability of the forecourt and maintaining its' condition are principal concerns. There has been no dialogue with the property owner to date;

- **Bridging the roots to allow safe passage along the footway:** due to the significant upstand of the roots and the gradient of the footway, this option has been dismissed; due to the gradient, fall and profile created in the bridging the roots resulting in water runoff into adjacent properties.
- **A buildout:** See the outline drawing of the buildout required to ensure safe passage around the tree, which impacts on the availability of space for parking on an already very congested street. Bollards will be required with a potential conflict with the current road junction;
- **Tree is replaced:** due to the damage to footway which prevents safe passage the feasibility and costs of the buildout and potential conflict with junction.

Recommendations

Public consultation in accordance with the Sheffield Street Tree Strategy on the replacement of the mature Sycamore to allow the footway to be reinstated allowing safe passage and a suitable replacement tree to be selected, potentially relocated to a more suitable location as Edgedale Road is already heavily tree lined, therefore meeting one of the Strategy's aims to redistribute the tree population.

Current layout and outline design drawing



3.11 Gatefield Road

Issues

- The works outstanding from the early investment stage is a 40m approximate section along Gatefield Road to the junction of Abbeydale Road of both footway and carriageway due to three (3) trees where kerbs are missing, tree pit edgings are raised necessitating reconstruction;



- Photo on the left shows the displaced kerbs on the footway build out at the junction of Abbeydale Road;
- Top & middle left photos show the trees on either side of the road where the kerbs have been displaced due to the stem and buttress roots being in the kerb line. Reinstatement or use of thinner kerbs is not possible;
- Photo bottom right shows where the section of footway surfacing remains to be completed.

Options

- The tree located at the junction of Abbeydale Road as shown above on the left shows the extent of the current footway build out beyond the tree therefore minimising the risk of root damage with minor reduction to the first parking bay.

Two options to be considered for the missing kerbs as shown in the photos on the left are:

- **Option 1:** Reinstate the kerbs
The extent of the rooting into the carriageway requires further investigation to define the extent of a build out required, potentially 750mm with bollards, which will impact on the street losing available parking space.
- **Option 2:**
To minimise the need for excavation, continue to compromise current standards accepting missing kerbs. There is sufficient upstand to deliver an asphalt overlay on what is currently a one-way, residential street congested with parked cars. No impact on current drainage.

Recommendations

The footway requires reconstruction with tree pit incorporated. Due to the scale of the trees and to ensure longevity of the surfacing, recommend the use of a permeable surface.

3.12 Grove Avenue

Issues

- Carriageway and footway resurfacing work has been completed during the early investment stage, however outside property number 21, the kerb line is missing with the tree buttress roots filling the void created and a footway patch either side of the tree remains to be completed;



- The photo above shows the tree and location of the missing kerbs plus outstanding footway patches to be resurfaced which will conclude all necessary work on the street.

Options

- The street is residential and congested with parked cars though the tree itself is in good overall condition;
- There are two possible options to be considered:
 - Create a build out of 750mm in size with bollards potentially losing a minimum of one parking space. This may also impact on the access to a residential property's driveway;
 - To demarcate the encroachment into the carriageway with lining, although the tree roots do not go beyond the existing kerb line at present. No implications for drainage or other issues associated with this approach.

Recommendations

The continued relaxation of current standards in relation to the missing kerbs and reconstruct the footway including a tree pit.

No change to the highway network proposed with the tree retained.

3.13 Hunter House Road

Issues

- Previous remedial works undertaken on the initial nine (9) trees identified for replacement resulted in a number successfully retained with thinner kerbs and footways addressed through the removal of historic asphalt overlays;
- However, several defects remain at the junction with Psalter Lane and outside number 155. Carriageway and footway resurfacing remains outstanding.



- **Photo on the left:** outside property 155 where the kerb has been displaced due to the extent and size of roots and cannot be reinstated. An asphalt inlay was constructed in the place of the kerb as a temporary measure. The pavement patch completed at the same time has failed 2 years on creating an uneven surface, further investigation have been undertaken in August 202, summary provided below:
-

- **Both photos on the right:** these two trees are located at the junction with Psalter Lane. The footway defects were previously addressed approximately 2 years ago and are now showing significant deterioration, with kerbs displaced on the tree within the junction.

Tree Outside 155 Hunter House – Site Investiagtion



The photos above show the extent of the roots running along the footway, up to an under the private boundary wall causing damage. The upstand of the roots above the footway / kerb face is 180mm.

Options

The tree outside 155: Hunter House Road is a residential street with no off-street parking available. It is therefore it is congested with parked cars and as such is considered a premium parking area.

The options available are:

- Replacement of the tree due to the extent of damage to the footway; it is not possible to reinstate the kerb and parking is at a premium on this street.
- Build out required due to the extent of roots extending into the carriageway and to provide sufficient passage for users. It is estimated following the investigations the build out would be required to extend 2m into the carriageway and approximately 10-12m in length, removing a significant number of parking spaces.

- The footway if the tree was retained can not be rectified by alternative materials, due to the significant upstand of the roots, the required ramping up to the tree creating excessive gradient created and the additional pressures on the boundary wall retaining the footway in situ.

The footway and kerb defects at the junction of Psalter Lane:

- The footway maybe addressed through reconstruction of a tree pit and resurfacing to be replaced with a permeable surfacing solution to maximise the width to allow safe passage and to allow some flexibility and movement in future to minimise surfacing cracking;
- For the kerb line alignment review the radius of the junction to allow the kerb line to extend beyond the tree without compromising the junction. Roots are protruding through the kerbs and likely to ingress into the carriageway surface, therefore, extending the radius to incorporate the extent of the root will be necessary to enable surfacing of the carriageway to be concluded.

Recommendations

The tree located outside property 155, is recommended for replacement, subject to consultation under the Street Tree Strategy Appendix 5, this is due to the evident damage to third party wall, the inability to rectify the footway damage without creating a alternative footway in the carragway around the tree with the loss of considerable parking within the street.

The tree located on the junction will be retained through the use of a premeable surface on the footway if deemed necessary and the adjacent of the kerb radius at the junction.

3.14 Kenbourne Road

Issues

- Extensive uplift of the footways and kerb displacement with rooting into the carriageway;
- Extensive site investigation was undertaken in May 2021 to inform the proposals outlined below. The following images show the extent of the damage that is evident, with displaced kerbs, extensive rooting into the carriageway and the image far right show previous remedial works undertaken which addressed the footway and kerb but did not address the rooting in the carriageway which impedes successful resurfacing of the street.



Options

- The outline design proposal for Kenbourne Road below will have an impact on the street scene with several buildouts proposed and the replacement of one tree. The replacement tree is seen above on the right-hand side. It is a mature Ash which is in decline because of Ash Die Back and is considered by the Tree Inspector to be at such a point of decline that replacement is essential for the safety of the road user and residents.
-

Recommendations

- To ensure successful retention of the trees, providing a permanent solution and enabling completion of the outstanding resurfacing to both carriageway and footway, the proposed design solution introduces nine (9) buildouts of various sizes to the street. They are non-standard sizes to minimise where possible the impact on available on street parking and use of bollards adding further street furniture;
- The changes proposed will have a significant impact on the street scene introducing several changes to the highway network which may impact on the residents and the availability of parking.

Outline Design Proposal



3.15 Kenwood Park Road

Issues

- In the early investment stage, fifteen (15) trees were identified for replacement out of the total tree population. In May 2021, further investigations were undertaken on what is a wide, residential, heavily tree-lined street. The number of defects associated with the trees and the carriageway far exceed 15, with multiple kerbs missing or displaced and tree roots extending into the carriageway.



Options

- Following the investigation in May 2021, outline proposal and designs are being developed, with resurfacing and improvement works planned for 2022;
- The width of the carriageway provides several options to be explored including options to address leaning trees with signage and/or build outs, and resurfacing options such as full width reconstruction or local reconstruction with an overlay solution. No trees have been identified for replacement.

Recommendations

- To ensure successful retention of the trees, providing a permanent solution and enabling completion of the outstanding resurfacing to both carriageway and footway, the proposed design solution will consist of a variety of solutions similar to those delivered on Ruddle Road, such as minor deviations of the kerb line, build outs of up to 600mm where significant roots are present in the carriageway;
 - In addition to the changes being introduced, where kerbs are missing and where the void occupied by the tree stem does not involve tree roots extending into the carriageway that will impede the resurfacing, ongoing compromise to current standards are to be accepted.
-

3.16 Kenwood Road

Issues

- In the early investment stage, seven (7) trees were identified for replacement. Over recent months, further investigations have been concluded, highlighting a greater number of defects associated with the street trees;
- Most of these defects are being corrected at the point of investigation or require minor deviations to the kerb. However, several trees leaning into the carriageway are a risk to high sided vehicles and need to be addressed.



Options

- As stated above, several defects are being corrected on-site during investigations but a number at risk of high-sided vehicles need to be addressed. No trees are considered for replacement.

Recommendations

Design solutions to be concluded at end of September 2021 following which the report will be updated.

3.17 Ladysmith Avenue

Issues

- On entering Ladysmith Avenue from Machon Bank Road there are several Lime trees on both sides of the carriageway where kerbs are missing, and the buttress roots extend into the edge of the kerb line or into the carriageway;
- This is replicated along the length of Ladysmith Avenue, where the trees are of a similar age and size. Eight (8) out of the ten (10) trees present have displaced kerbs or kerbs are missing. The footway overall has minor defects.



- Top photo shows the trees as you enter Ladysmith Avenue from Machon Bank Road;
- Photo bottom left shows the missing kerbs on the first tree on the right as you enter Ladysmith Avenue;
- Photo bottom right shows the tree on the left as you enter Ladysmith Avenue, again with missing kerbs.

Options

- If the reinstatement of the kerb line is required, the options are limited to numerous build outs where trees have displaced the kerb line. Previous inspections have identified that there is insufficient space to install slimmer or alternative kerbs;
- This will have an impact on the street which is residential, where parking is congested and outside premises it is extremely sought after. The use of build outs will restrict parking availability further and change the street scene significantly;
- Considering the street as described above there is an option to compromise on standards leaving kerbs out. The surfacing solution, with sufficient threshold along the existing kerb line would be an overlay with local reconstruction where required to address any construction failures, minimising disturbance of the surface and risk to the trees;
- Following localised reconstruction, the surfacing could be a 30mm or micro-overlay solution.

Recommendations

To compromise on standards, accepting missing kerbs, with an overlay solution to deliver the improvement to the condition of the carriageway. The footways require full reconstruction, hand excavation around the trees and construction of tree pits where required.

3.18 Marlcliffe Road

Issues

- Two (2) trees identified for replacement due to disruption of the footway by shallow roots and buttress roots displacing kerbs;
- Both trees remain in-situ and in a fair condition. The carriageway was resurfaced during the early investment stage and the footway defects investigated and addressed, though further remedial work is now required. The kerbs remain displaced.



- **On the left:** The kerbs have been displaced by the buttress roots, with roots in line with the outer edge of the kerb line. This prevents the kerb from being reinstated and pruning a root of that size is not feasible;
 - **On the right:** the footway has some minor ramping and roots present.
-

Options

- **Footway:** hand excavation of the footway to allow for a 60mm reconstruction, extension of the tree pits to exposed roots and resurface. Based on visual assessment it is suitable for traditional asphalt, however, consider a permeable surface depending upon depth and extent of the roots following excavation;

With regard the missing kerbs the following options have been considered:

- Due to the presence of roots and extent of buttress/stem within the kerb line, no edgings or alternative kerbs can be installed. Therefore, Sheffield City Council could continue to provide relaxation of current standards, using lining to highlight to road users the presence of roots though they do not extend beyond the kerb line. The risk to road users is low and whilst the kerb has been displaced by the tree stem and it is a significant feature on the road, there is no impact on carriageway which must be resurfaced;
- Alternative is to consider a buildout to the two trees, minimum of 600mm recommended, with reflective bollards that will require detailed design as one may impede access to a residential property.

Recommendation

The continued relaxation of current standards in relation to the missing kerbs and reconstruct the footway with extended tree pits.

No change to the highway network proposed, trees retained.

3.19 Milden Road

Issues

- There are thirty-seven (37) trees along Milden Road, of which seventeen (17) are Ash trees. All were assessed in 2020 for Ash Die Back (ADB) with minor evidence visible at the time, therefore deemed to be in fair condition. However, the trees will need to be subject to annual monitoring and are likely to deteriorate to a point of replacement in the coming 5 years;
- The carriageway was resurfaced in the early investment stage, accepting that along the length of the road, several mature trees have displaced kerbs (natural stone) which are no longer present (photos on the left);
- The footway resurfacing remains outstanding, with evidence of roots present in the footway (photo on the right) causing surface defects and ramping.



Options

- The key factor is the tree species. With mature Ash, due to Ash Dieback (ADB) the remaining life expectancy of the trees is limited to approximately 5 years. The trees will continue to be assessed annually and removed at the point the extent of ADB is deemed to be a risk to public safety. ADB is well understood by all stakeholders in the management of street trees;
- One option is to replace all Ash trees at a single point in time, reinstating the missing kerbs and reconstructing the footways, with replacement trees planted in a single planned period minimising disruption to residents and delivering the improvements required to the footway;
- The alternative is a micro-overlay solution to the footway in the interim, with localised reconstruction where required. This will deliver an improved condition of the footway over the next 5 years. Prior to conclusion of the contract, it is anticipated a full 60mm reconstruction will be undertaken, with timing dependent upon condition assessed beyond 5 years when the trees have been replaced;
- With continued relaxation of standards in relation to the missing kerbs anticipated, lining to the carriageway surface to highlight the missing kerbs would not be beneficial as it is a residential street and cars park adjacent to the grass verge throughout. The buttress roots do not extend into the carriageway and therefore do not pose a significant risk to users.

Recommendations

In accordance with the Street Tree Strategy aims, the recommendation is to retain the mature Ash trees to a point at which the Tree Inspector deems it necessary due safety concerns to replace them on an individual basis, with suitable replacement planted in the following season.

At the point of replacement any footway and kerb defects will be addressed, with a tree pit constructed for the replacement tree.

Continued relaxation of standards in relation to the missing kerbs.

A further benefit to the approach allows the existing young trees on the street to gain greater stature, minimising the impact on the street scene as individual Ash trees are removed over time.

3.20 Milton Road

Issues

- Milton Road is a no through, residential road with a footway either side of the carriageway and trees present on the one side only;
- Kerbs have been displaced or are missing, with the footway width impacted by the trees limiting safe passage for certain users. Resurfacing and improvement works remaining outstanding.



- **Left photo:** the kerb has been replaced with edgings, however there is evidence of roots extending into the carriageway;
 - **Top right photo:** the kerb is no longer present, and the void is filled with the tree buttress root. There is no visual evidence of roots extending into the carriageway that will impede resurfacing work;
 - **Bottom right photo:** kerbs have been displaced by the tree but remain in-situ.
-

All three (3) trees are impacting on the width of the footway for users.

Options

- Where the kerb line has been displaced or where kerbs are missing and there is no opportunity to reinstate, the options are limited to continuing to compromise current standards and accept missing kerbs, or the introduction of build outs into the carriageway;
- The kerb line shown in the photo on the bottom right above may be corrected through the trimming of the existing kerb;
- In the top right photo where roots are evident in the carriageway will need to be investigated further but a minor deviation of the kerb line similar to the approach taken on Rundle Road may be appropriate;
- The footway requires resurfacing and as there is no significant ramping, a traditional surface is deemed to be satisfactory. However, with regards to the restricted width created by the trees, the options are limited to the tree being replaced or accepting the restriction on the basis that there is an alternative footway on the other side of road with no trees, it is a low use, no through road with no restrictions present and crossing points available at the junction.

Recommendations

The continued relaxation of current standards in relation to the missing kerbs and the reduced footway width.

No change to the highway network proposed, trees retained.

3.21 Montgomery Road

Issues

- Sixteen (16) trees originally due to be replaced to enable early investment improvements to take place with various footway defects including missing and displaced kerbs;
- The carriageway resurfacing has been completed, although kerb replacement remains outstanding. Footway resurfacing to be due to be completed in 2021;



- Montgomery Road is approximately 650m in length with grass verges either side and an avenue of mature Lime trees.

Options

- **Footways:** resurfacing is planned for 2021 during the maintenance phase. Work undertaken will consider the lessons learnt to date, with tree pits constructed where necessary and no alternative surfacing required other than traditional asphalt.

Recommendations

- **Carriageway:** due for a further treatment prior to the end of the contract. It is recommended that a review of the kerb line and possible solutions are considered at this time, alongside the continued challenges and changes facing the highway network, such as future Transforming Cities initiatives and approach to active travel. As a main thoroughfare, demand over the coming 16 years may influence change.

3.22 Oxford Street

Issues

- Carriageway and footway resurfacing remains outstanding. There are a greater number of trees creating defects to footways and kerb displacement than previously identified in the early investment stage.

For this report, Oxford Street is split into two areas:

- The section of parking off the junction with Crookes Valley Road;
- The downhill section from number 574 running adjacent to Ponderosa Park.

Section One



- The photos on the right show the current condition of the kerbs which are displaced and missing due to the presence of the trees, mature Planes, which are in a fair condition;
- Parking is a premium in the area as shown in the photo on the left, with two trees located inside parking bays and another on the outer edge inside the double yellow lines.

Section two:



The photos above show the common defects that exist along the length of the road, from minor kerb displacement, raised tree pit edgings and footway defects that need to be addressed.

Options

Section one:

- The two trees located within the parking bay have displaced the kerbs which are no longer in-situ, with the stem and buttress roots filling the void. The roots are extending beyond the kerb line into the carriageway at a depth that may potentially impede necessary resurfacing work.

The options available are:

- To maintain the kerbs line as is, investigate the site to identify the extent and depth of the tree roots. Minimise the depth of planing to avoid root damage, applying a surface overlay only, with a lining solution to highlight the tree's encroachment;
- Two build outs to be constructed of minimal length and to the full width to the parking bay with bollards added. This ensure the surfacing quality is not affected, the tree is provided sufficient space and minimises the risk of a vehicle strike and property damage in the future. The likely result is the loss of one parking space;
- The third tree located on the edge of the parking bay and double yellow lines has displaced kerbs with the stem encroaching into the carriageway. Site investigation is required to consider the extent of rooting into the carriageway, the location of the gully and whether a kerb line can be reinstated with a minor deviation without impacting or compromising road safety requirements.

Section two:

- Lessons learnt through joint inspections and recent work on Rundle Road and other streets to be applied to Oxford Street;
- Footways subject to 60mm reconstruction with hand excavation around all trees; no significant ramping only surface defects evident. Construction of tree pits to provide sufficient space for growth, removing old tree pit edgings from the footway. New surface to be asphalt and a permeable surface may be considered for those trees where the footway is narrow;
- Several sections of pedestrian guard rail exist on the footway, now redundant following school closure. Removal to be assessed and approved by Sheffield City Council.

Throughout Oxford Street there are multiple kerb defects. However, as parking is at a premium in the area build outs will restrict availability, therefore site investigation should be undertaken to:

- Establish if kerbs or alternatives can be reinstated or existing kerbs trimmed. Minor deviation to the kerb line to accommodate the trees without compromising the carriageway width;
- This section of the carriageway is on a slope, therefore kerbs that have been displaced, where the void is filled by the stem and/or buttress roots of the trees which will not compromise drainage, may be left out as continued compromise with current standards. The extent of rooting in the carriageway should be investigated though there is currently no visual evidence that resurfacing work would be impeded.

Recommendations

The continued relaxation of current standards in relation to the missing kerbs and the reduced footway width.

Use of alternative materials where a kerb line may be feasibly reinstated using edgings and slim kerbs.

Use of permeable surfacing to footway where required.

Installation of a build out in section one where the extent of rooting is significant in the carriageway and likely to impede resurfacing. It should be of minimal width and length to maintain the availability of parking which is at a premium in the area.

3.23 Psalter Lane

Issues

- The carriageway was resurfaced during the early investment stage, though the kerbs remain displaced at the tree originally identified for replacement at the junction with Cowlshaw Road, adjacent to number 136.
-



Options

- The Lime tree, in a fair to good overall condition, is located adjacent to the crossing point on a main throughfare. The kerb has been displaced by the tree and cannot be reinstated. This has not impeded the resurfacing work previously completed and no drainage issues have been identified;
- The options are limited to the tree being replaced, a build out or accepting the missing kerb and continued compromise of current standards.

Recommendations

The continued relaxation of current standards in relation to the missing kerbs.

The epicormic basal growth should be routinely trimmed to ensure sightlines are not compromised at the junction for pedestrians.

3.24 Ryle Road

Issues

- The initial assessment in the early investment stage considered one (1) tree for replacement due to an uplifted kerb, ramping to the footway and the tree's presence preventing safe passage;
 - Work has already been undertaken on several trees. However, the footway remains restricted due to the presence of Lime trees which is further compounded during the spring and summer months by epicormic growth making the footway impassable. In addition, the tree located on the junction of Moncrieffe Road has caused significant ramping due to roots in the footway as well as restricting width due to the size of the stem;
 - Carriageway surfacing has been concluded and one tree remains a central feature in the junction of Montgomery Road. Road lining is present with no other protection, though there is no evidence of any vehicle strikes.
-



- On the left, the photo shows the extent of the narrow footway due to the trees and epicormic growth; the middle photo is the tree located at the junction of Moncrieffe Road;
- The photo on the right shows the tree located in the junction of Ryle Road and Montgomery Road.

Options

- **Footway:** remove and replace the trees with a more suitable species despite all trees being in a fair condition. Replacement trees of a suitable species, without epicormic growth would allow sufficient width for safe passage by users. However, this option is not aligned to the Street Tree Strategy outcomes;
- An alternative footway is available on Ryle Road with sufficient crossing points. Therefore, limit the extent of footway surfacing as indicated on the design drawing below where access to properties, garages and substation is required. Provide an additional tactile crossing as indicated on the drawing and reclassify the footway. The footway would remain subject to safety inspections with remedial work undertaken as required, however it would not be subject to future condition and serviceability inspections;
- **Carriageway:** Lime tree located in the junction of Ryle Road and Montgomery Road has no visible signs of vehicle strikes, is currently in fair condition and with a life expectancy likely to exceed the remaining contract term.

Recommendation

- **Footways:** second option as outlined above. Accepted in principle upon initial review by Sheffield City Council representatives on the 22nd June 2021. The loss of a section of footway and introduction of additional crossing point to retain all trees and ensure a permanent solution is in place by making a change to the highway network.



3.25 Sandford Grove Road

Issues

- Carriageway completed above speed cushion towards Archibald Road. Below this point resurfacing work remains outstanding, with various defects including missing kerbs along the footway.



Top right photo: located on the junction of Marden Road, the kerbs have been displaced with an asphalt infill in place. There is no visible evidence of rooting into the carriageway. Both footway and carriageway resurfacing remain outstanding;

Top left photo: outside number 82, kerbs are displaced, and the tree buttress roots extend beyond the kerb line;

Middle right photo: outside number 81 has previously been investigated and edgings have been applied, however further investigation into the potential rooting into the carriageway is still required;

Middle left photo: located within the speed cushion, the kerb line has been displaced by the mature Plane tree buttress roots.

Options

The options for the individual site highlighted above are summarised below:

- **The tree located on the junction of Marsden Road:** the extent of the rooting into the carriageway to be investigated to inform the potential options. The tree has only displaced the kerb with no significant roots into the carriageway. Consider the accepting compromise to current standards and the missing kerb. However, if roots intrude into the carriageway surface the potential solution is bring the kerb radius out to incorporate the extent of the roots, aiming to minimise the impact on the junction. A design and road safety review will be required;

Footway requires a tree pit creating, use of permeable surfacing to minimise future maintenance and maximise width to allow users safe passage.

- **Tree outside Property 82:** the likely extent of root encroachment will require the construction of a build out, potentially up to 750 mm with bollards. Further investigation required. In addition, the footway surfacing will need to be reconstructed, to maximise width for users and a permeable solution considered;
- **Tree outside Property 81:** unlike the above, edgings have been installed in place of traditional kerbs. There are no visual signs of root intrusion into the carriageway, although site investigation will be required to minimise risk of damaging any tree roots during the carriageway resurfacing. If roots are identified within the recommended surface depth, a build out will be required and the footway treated as above;
- **Tree is located within the speed cushion:** due to the tree's position it will not impede resurfacing of the carriageway as this area will not be subject to the planing and resurfacing process. Therefore, the options available are:

The speed cushion ensures traffic passes at low speed therefore, the risk is low in relation to the lack of defined kerb. Applying lining to the surface would highlight the encroachment to road users such as cyclists.

An alternative is to extend a build out into the speed cushion which will ensure cyclists avoid the risk of the tree encroachment. However, this will remove the drainage channel, though lining does exist to show the narrowing of the road which all users should comply with.

Recommendations

The options to retain the trees are limited such as implementing build outs for those trees outside properties 81 and 82 and the adjustment of the kerb radius at the junction with Marden Road.

The preliminary works ahead of the planned resurfacing should investigate the extent of root intrusion with the aim of minimising the width of any built out and subsequent impact on the street and availability of on-street parking.

With regards to the tree within the speed cushion, accept the ongoing compromise to current standards in relation to missing kerbs.

3.26 Sheldon Road

Issues

- Sheldon Road is lined with mature trees but has significant issues including raised footways, displaced kerbs, and obstruction of the footway.



- Top right photo shows the overall tree coverage along Sheldon Road affecting both sides of the carriageway;
- Bottom right photo shows several trees where kerbs are missing and narrowing of the footway;
- Photo on the left shows a restriction of safe passage along Sheldon Road due to the tree.

Options

- Further investigations are planned for October 2021 to provide a clearer understanding of the extent of the tree roots in the carriageway and footway disruption, footway obstruction and the extent of tree leaning into the carriageway which have been subject to numerous strikes by high sided vehicles in the past. The street is a busy thoroughfare with high footfall, is heavily congested with parked cars and a bus route;
- Whilst the carriageway has been resurfaced, several kerbs are missing or displaced. These need to be investigated and potential solutions considered. Design input will be critical to consider the options available.

Recommendations

To be defined upon conclusion of site investigations.

Issues

- Five (5) trees were originally identified for replacement due to defects in the carriageway and footway, compounded by the proximity of the trees to vehicle crossing points and third-party properties. Displaced kerbs and evidence of rooting into the carriageway prevented completion of improvement works in the early investment stage of the contract.



- **Top left outside 17:** access to the property is currently achievable but may be problematic in the future;
- **Top right outside 29:** major stem encroaching into the highway with kerbs displaced and edgings used previously;
- **Bottom left outside 18:** major stem encroaching into the carriageway;
- **Bottom right:** missing kerb although tree is in a fair condition at the junction of Mylnhurst Road.

Options

Outside 17:

- Construct a tree pit. Excavate and reinstate the kerb line with edgings, assuming there are no significant roots into the carriageway or footway and the vehicle crossing point is reconstructed with a traditional asphalt surface; OR
-

- Construct a buildout. Use low kerbs, less than 750mm to negate the need for bollards to demarcate the carriageway whilst not creating an obstruction to the driveway.

Outside 18 and 29:

- Both trees are opposite each other and the likelihood of roots being present in the highway is high. Therefore, to retain the trees it will be necessary to introduce a change to the street scene by installing buildouts, minimising their width to ensure impact to the street is minimal;
- The tree opposite outside 18 will require further consideration in the design of the buildout to minimise the impact on access to the property;
- Full design required to accommodate both two trees, creating suitable buildouts which don't further restrict access to the properties and the road user.

Junction of Mylnhurst Rd:

- The tree has displaced the kerb. Therefore, excavation is required to identify extent of rooting into the carriageway and the opportunity to install a thin kerb/edging or minor deviation to the kerb line to rectify the defect;

The alternatives are:

- If, due to the presence of roots a kerb/edging cannot be installed. Rooting does not impede surfacing works therefore relaxation of current standards and acceptance of missing kerb line with lining applied to the highway; OR
- An alternative to relaxing current standards or if roots are identified in the carriageway at a depth that will impede the carriageway surface, install a buildout. Due to the proximity of the junction and the impact on road users, a Roads Safety Audit will be required.

Recommendations

Outside 17: hand excavation in proximity to the tree to reinstate the kerb line potentially using edging if the presence of roots prevents use of a full kerb being reinstated, accepting relaxation of current standards.

Outside 18 & 29: further excavation of the trees is required to determine the extent of the rooting into the carriageway including depth. Buildouts will be required to provide a permanent solution. Aim to minimise the width of the buildout to allow surfacing works to be progressed without damaging the roots. Estimate to be no greater than 500mm from the existing kerb. This is a change to the highway network.

Junction with Mylnhurst Road: based upon experience to date, the aim is to reinstate the kerb line using an edging or thin kerb, opting for the first option outlined above.

These recommendations ensure the trees are retained on a permanent basis, through the introduction of several changes to the highway network, whilst mindful of minimising residential access through design.

View of Silver Hill Road from the junction of Mylnhurst Road:



3.28 Spring Hill Road

Issues

- Carriageway surfacing remains outstanding. A proportion of the footway surfacing has been completed however not in proximity to the trees, therefore defects remain in-situ, with kerbs displaced or missing. The footways surface is poor with historical patching around the trees, uneven and restricted in parts due to the girth of the tree;
 - Throughout the street, nineteen (19) trees exist in total, twelve (12) of which are causing damage to the existing infrastructure. Three locations have kerbs displaced or missing, with buttress roots extending into the kerb line preventing reinstatement.
-



- **Top left photo:** shows defects in the footway and missing kerbs with previous patches evident to address the failing surface;
- **Middle left photo:** a short-term solution of installing edgings to replaced previously missing kerbs;
- **Middle right photo:** shows the extent of footway damage with ramping near a utility cover and associated chamber;
- **Bottom right photo:** there is significant ramping of the footway due to tree roots present.

Options

- **Footways:** hand excavation required around the affected trees and tree pits constructed using a permeable surface solution to allow some flexibility over time to minimise footway cracking and deterioration, whilst maximising the width of available footway to allow safe passage;
 - Footway reconstruction is required, investigating the extensive ramping in places, the most significant of which is shown in the middle right photo where the footway has ramped significantly near a utility cover;
-

Options are limited to address the missing kerbs. The street is residential, congested with park cars however, due to the likely extent of tree roots encroaching into the carriageway surface which will impede the improvement works necessary, potentially three (3) build outs are required:

- One considered to be minor outside number 38, or alternatively leave the kerb out, accepting the ongoing compromise to current standards. This is subject to site investigation prior to resurfacing;
- Outside number 31 of sufficient width in the parking bay to allow persons to use it to pass the tree safely as the current width between tree and boundary is insufficient. By providing a permanent solution there is sufficient space for the tree to grow;
- Outside property 33 to replace the temporary edging previously applied, aiming to minimise the width and length of the build out to provide a permanent solution.

Recommendations

The introduction of the build outs is essential to enable the trees to be retained and maintain a footway for users. However following site investigations into the extent of the root intrusion in the carriageway, it may be acceptable to leave the kerbs out, accepting the continued relaxation of current standards.

The footway as highlighted above requires a reconstruction, removing historic patches and to reprofile, using a permeable surface solution to minimise future maintenance.

3.29 Steade Road

Issues

- Steade Road is heavily lined with mature trees. The carriageway resurfacing remains outstanding with minor footway defects throughout. Overall, thirteen (13) trees are of concern where damage to the highway is evident.



The photos above are a sample of the issues to be addressed such as missing kerbs and tree buttress roots extending into the carriageway. Out of the thirteen (13) trees of concern, up to eight (8) trees along the length of Steade Road are impacting on the kerb line, with kerbs either missing or displaced and with roots potentially extending into the carriageway. Overall, the footway defects consist of minor ramping and cracking due to tree roots.

Options

- To minimise the impact on residents and the availability of on-street parking, there are several displaced kerbs (3 trees) where the kerbs may be trimmed and re-installed in-situ. However, site investigations are required to ensure there are no roots are extending into the carriageway.

With regards to the remaining five (5) trees, the following options exist:

- To minimise impact on the street, assuming from previous streets investigated the roots are unlikely to exceed 500mm into the carriageway, leave a 500mm channel along the kerb line during the planing and reconstruction of the surface, concluding the resurfacing with an overlay up to the kerb line, minimising any disturbance to the tree and surface and the risk of any damage. Therefore, no builds out is required, the displaced kerb's void has been filled by the tree stem, with lining added on completion to highlight the tree's presence in the kerb line;
 - Alternatively, at least 5 build outs, each approx. 600mm in width, without bollards will be required which will impact on the street scene and possibly current drainage and will result in the loss of on street parking;
 - The footway requires reconstruction, hand excavation in accordance with good practice in proximity to the trees, with tree pit extended removing any existing edging. Removing the historic overlay patches and reconstruction of the footway will reprofile the surface.
-

Recommendations

To minimise the impact on the street scene and provision of on-street parking, a combination of ongoing compromise to current standards will be required in relation to missing kerbs, accepting where there is no root intrusion to impede resurfacing of the carriageway.

Following further investigation where build outs are required, they are similar to Rundle Road where they are minimised in length and width.

3.30 St Ronans Road

Issues

- Along the length of the St Ronans Road, fourteen (14) trees have been identified where defects exist and need to be addressed. Only two (2) were previously identified in the early investment stage for replacement;



- The photos above are a sample of the issues identified on the street resulting from the presence of mature trees which are in fair to good overall condition;
- Neither the footway nor carriageway have been resurfaced to date.

Options

Footways:

- 60mm reconstruction required throughout with hand excavation around the trees and the construction or extension of existing tree pits. This will address the footway lifting and the current defects identified from recent inspections. This applies to all fourteen (14) trees.

Carriageway and kerb line defects:

- In total eight (8) trees have compromised the kerb line as shown in the examples above. Two (2) have been marked up on site requiring the kerb line to be trimmed, with all kerbs in-situ;
- To address the above, site investigation will establish the extent of tree roots in the carriageway with the aim of minimising extensive build outs as it is a congested residential street and parking is at a premium. Therefore, applying lessons from Rundle Road, it is estimated 4 build outs will be required with other existing kerbs trimmed, kerbs or alternatives to be reinstated at the kerb face. A small number may be subject to ongoing compromise to current standards in relation missing kerbs.

Recommendations

The options are limited and will be further defined following the site investigation during the preliminary works ahead of the planned resurfacing. However, based on visual inspections it will be a combination of minor build outs and ongoing compromise to current standards in relation to the kerb line.

Footway defects will be address through the planned reconstruction.

3.31 Thompson Road

Issues

- An avenue of mature trees from the park entrance to the junction with Ecclesall Road which have displaced the kerbs, with rooting extending into the carriageway, disrupting the footway, constructed with York stone flags but with a number replaced with asphalt patches;
- Carriageway resurfacing remains outstanding in proximity to the trees and 20m beyond the park entrance.



- Above photos of the tree located at the park entrance where kerbs have been displaced and there is significant root in the kerb line. The gully has also been buried by the displaced kerbs;
 - Photos below show the damage to the footway due to the presence of tree roots which have raised the flag stones. To rectify the trip hazards, the flag stones have been lifted and replaced with an asphalt surface path.
-



Options

Tree closest to park entrance:

- Excavation of the carriageway is required to reposition the gully to ensure the drainage system is functional and can be accessed for future maintenance;
- To address the kerb displacement and rooting into the carriageway, it is possible to extend the kerb radius located on the edge of the final parking bay, out and into the parking bay to provide sufficient space for the tree, minimising impact on the street and the gully moved above the buildout approx. 2-3 metres away.

Carriageway defects:

- Several kerbs are missing due to the trees with channel setts displaced. In the section of parking there is no evidence of rooting into the carriageway, therefore, each tree will be hand excavated, with the channels setts and kerbs re-laid;
-

- The proposed carriageway treatment is to strip off the asphalt surface to expose the setts and carry out any necessary repairs, leaving a final surface of traditional cobbles. This will allow the remedial work to be completed to the channel and kerb lines;
- However outside of the parking bays towards the junction kerbs are missing. Either replace with an asphalt overlay or by the tree roots, within a section of double yellow lines. Further investigation into the extent of the roots is required.

Footway defects:

- The footway is to be addressed by lifting and relaying the flag stones where possible, removing existing tree pit edgings which have been raised or displaced. The width of the footway is sufficient to allow the tree pits to be created and recommended treatment is the use of flexi pave.

Recommendations

Carriageway micro-planing to expose the traditional setts will enable remedial works to be completed in proximity to the trees, minimising the loss of parking, reinstating the footway where feasible with the traditional York stone flags, tree pits constructed and use of a permeable surface improving the street scene.

3.32 Thornsett Road

Issues

- Thornsett Road is lined with mature trees, predominantly in verges therefore minimising the risk to footway though there are defects associated with the tree where the footway is raised extensively in places;
- The carriageway has kerbs displaced and missing with evidence of root intrusion.



Options

- Further investigations were carried out in May 2021 to identify the extent and depth of roots within the carriageway and inform the final design solution which to due to be concluded in August 2021. No trees are considered for replacement.

Recommendation

Awaiting final design solution which is likely to recommend two build outs outside numbers 3 and 5, Thornsett Road. For the balance of the road, a compromise to current standards in relation to missing kerbs and alternative material use will likely be required.

3.33 Woodstock Road

Issues

- During previous investigations on Woodstock Road several defects associated with the trees and carriageway have been addressed, with kerbs replaced with edgings where possible;
- However, defects remain and those already installed are considered short term. Outstanding work involves missing and misaligned kerbs on a street where parking is highly sought after;
- The other key factor on the street is the prominence of six (6) Ash trees, all mature and at risk of Ash Die Back (ADB) which is likely to see their decline and replacement over the next 5 years.



- **Top right photo:** a sample of the condition of the kerb line in the vicinity of the six (6) Ash trees along the road;
- **Top left photo:** an example of other defects along the road caused by trees other than Ash. Displaced or missing kerbs or where previous remedies have failed such as the installation of edgings outside numbers 66, 67, 71 and 82;
- **Far left photo:** outside number 19 is a mature Plane tree that has been topped. Its' form is poor, and the kerbs have been displaced.

The Ash trees are located as follows:

Outside number 11: edgings previously applied where loose

Outside number 40: kerb line defect previously rectified

Outside number 56: previously topped with edgings in place

Outside number 59: footway reduced to under 1m, no kerb present

Outside number 75: sparse crown (ADB), edgings replacing the kerb

Outside number 86: missing kerbs, located adjacent to speed cushion

Options

- The Ash trees located outside numbers 75 and 86 will be recommended for replacement in 2021 due to evidence of Ash Die Back, and sparse crown;
- With regards to the remaining Ash trees, all are likely to decline and require replacement over the next 5 years. To resolve the footway and encroachment of tree roots into the highway, two build outs have been identified, though one outside number 59 will conflict with the disabled parking bay opposite;
- Any investment in changes to the infrastructure to sustain the existing Ash trees will be short lived. As a temporary measure, thinner kerbs could be considered on the remaining trees to minimise loss of mature trees in a single phase of replacement;

Regarding the other trees present, excluding the tree outside number 19, the options include:

- An increased number of build outs along the road as a permanent solution though this will impact significantly on the availability of parking on a street which is already heavily congested;
- From visual assessment on-site the rooting of trees other than the Ash trees do not encroach the highway, therefore the edgings could be reinstated, kerbs trimmed, or as per the photos where the tree fills the gap, continued compromise to current standards by leaving the kerb out as they pose no significant risk to road users or pedestrians;
- The Sycamore located outside number 82 is recommended for replacement due to its condition;
- Following a recent inspection, the tree outside number 19 is recommended for restorative pruning due to the number of trees recommended for removal in proximity to its location. The crown has recovered from previous topping and can be maintained into the future with highway defects corrected. The tree will be subject to enhanced inspections to ensure the crown develops without structural defects.

Recommendations

Consultation in accordance with the Street Tree Strategy to be progressed for the three (3) trees identified above for replacement due to their condition.

Ongoing monitoring of the Ash trees in relation to Ash Die Back with replacement recommended when deemed necessary by the qualified tree inspectors.

Undertaken restorative pruning of the tree outside number 19 and continue to monitor to ensure the crown successfully develops.

During the preliminary works ahead of planned resurfacing works, undertake investigation to identify the extent of rooting into the carriageway with the aim of minimising the number and extent of build outs required.

Where no rooting exists beyond the kerb line or if at a depth unlikely to impede resurfacing, a compromise to current standards in relation to missing kerbs may be accepted.

Reconstruct the footway, extending tree pits and reprofiling the surface.

Summary Status

Street Name	No of Highway Trees (identified in CIP)	Option Summary
ALBANY ROAD	2	Potentially a single build out required
ALDAM ROAD	3	Potential build out required
ALDFIELD WAY	1	Cancel replacement status. No action
BANNER CROSS ROAD	9	Design solution – build outs, drainage impact
CHIPPINGHOUSE ROAD	2	Design solution – build outs, street scene impact
CLIFFFIELD ROAD	1	Potential replacements
COVERDALE ROAD	1	Build out recommended

DUNKELD ROAD	3	Replacement programme, build outs & change of material
ECCLESALL ROAD	11	Design solution, change in material and contract relief
EDGEDALE ROAD	8	Tree replacement recommended for the 1 remaining tree unresolved
GATEFIELD ROAD	2	Build outs and material change
GROVE AVENUE	1	Potential build out
HUNTER HOUSE ROAD	9	Design solution, material change, recommend replacement of tree outside 155
KENBOURNE ROAD	7	Design solution
KENWOOD PARK ROAD	15	Design solution
KENWOOD ROAD	7	Design solution
LADYSMITH AVENUE	10	Design Solution
MARLCLIFFE ROAD	2	Recommend replacement status cancelled (closed) with on going relaxations of standards
MILDEN ROAD	3	Ongoing relaxation of standards, replacement status cancelled & reopened on tree condition as required in the future
MILTON ROAD	3	Ongoing relaxation of standards Cancel replacement status (closed)
MONTGOMERY ROAD	16	Ongoing relaxation of standards. Cancel replacement status (closed)
OXFORD STREET	4	Design solution, build outs and material change
PSALTER LANE	2	Ongoing relaxation of standards Cancel replacement status (closed)
RYLE ROAD	1	Design solution. Change of use, replacement status cancelled (closed)
SANDFORD GROVE ROAD	1	Design solutions
SHELDON ROAD	7	Investigation required to inform outcome
SILVER HILL ROAD	5	Design solution
SPRING HILL ROAD	9	Potential build out and material change
STEADE ROAD	3	Potential build outs and material change
ST RONAN'S ROAD	2	Potential build outs
THOMPSON ROAD	4	Material changes and ongoing contractual relief
THORNSETT ROAD	10	Potential build outs
WOODSTOCK ROAD	8	Ongoing contractual relief, replacements and build out required

Glossary

Ash Die Back A chronic fungal (hymenoscyphus fraxineus) disease of Ash trees characterised by leaf loss and crown die back in affected trees. It is highly infectious and destructive. More information is available on the Woodland Trust website, www.woodlandtrust.org.uk

Asphalt Often referred to as tarmac. A mixture of aggregates, binder, and filler, used for constructing and maintaining roads and pavements

Build Out A build out is defined as a deviation from the original kerb line greater than 300mm into the existing carriageway and would usually remove an on street parking space, those greater than 750mm depth also require a bollard for visibility.



Carriageway Roads; streets

Defect Fault, deficiency, or flaw

Displaced kerbs Kerbs moved out of their proper or usual position

Early investment stage Initial five-year period of the Streets Ahead contract from 2012 – 2017

Edging Thinner version of a standard roadside kerb in either concrete or stone

Epicormic growth Growth of new shoots from epicormic buds which lie under the bark of a trunk, stem, or branch of a plant

Footways Footpaths; pavements

Ingress To go in or to enter

Kerb deviation Any variation to the kerb line less than 300mm would not be classed as a build out but a kerb deviation



Maintenance phase Refers to the Streets Ahead contract period from 2018 – 2025

Micro-overlay A surface treatment laid over the top of an existing surface to seal and protect it

Micro-planing Removal of the top surface of a road or pavement

Reconstruction Refers to traditional surfacing where a road or pavement is reconstructed by removing the top surface and relaying new asphalt

Remedial work Investigating and applying a solution to a road or pavement

Setts Granite paving block cut to a uniform size

Uplift/ramping Where tree roots lift the surface of a pavement creating a raised area or ramp

Appendix One

Examples of best practice applied to date to retain street trees addressing the conflict with the highway infrastructure:

Western Road:

Use of a permeable surface, a premium product, around the trees. The hand laid surface is taken up to the stem to maximise the available width of the footway. The nature of the material allows movement, minimises cracking and surface deterioration compared to traditional asphalt surfacing.



Meersbrook Park Road & Rundle Road:

Introducing buildouts. Dialogue between Amey Consulting & Sheffield City Council Road Safety Team regarding the implications and requirements to ensure the safety of a buildout in relation to bollards and TROs has concluded the following recommendations:

- A bollard should be installed on a buildout if the width is, or exceeds, 0.75m;
- Double yellow lines or similar are not necessarily required as the buildout widths are approximately 'half-a-cars' width', so they should not cause issues. However, if an issue does arise, introduction of a TRO may be considered. Restrictions other than double yellow lines may be implemented around the buildouts themselves to prevent motorist from parking in places causing obstructions to traffic on that road.



For Meersbrook Park Road as shown above:

Creating/extending tree pits due to the extent of rooting in the footway as a result of historic overlay patch repairs which had led to significant deviation to the footway profile. Upon excavation and exposing of the roots, a tree pit was created to allow the remainder of the footway to be reprofiled, resurfaced and with mulch applied to the tree pit delineating the footway for the user.

For Rundle Road below:

Example of a minor buildout. No requirement for bollards. Lining used to highlight to the road user the deviation along the carriageway.

