ATKINS

Cambourne to Cambridge Better Bus Journeys

Park & Ride Location Study

CCC

21 April 2017

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Purpose of this Study

On the 13th October 2016, the Greater Cambridge City Deal (GCCD) board made a decision to instruct officers to undertake further appraisal on the location of the proposed Park and Ride (P&R) site near Madingley Mulch roundabout, including a review of the proposed Scotland Farm location.

Three sites are considered in this study:

- Scotland Farm: to the north of the A428 and east of Scotland Road;
- Madingley Mulch Site 4: to the east of Madingley Mulch Roundabout, to the north and south of Madingley Road; and
- Madingley Mulch Site 1: to the north of the A428 and Madingley Mulch Roundabout.

This study outlines the planning policy, transport and environmental considerations for each site and provides an assessment of the viability of each site against these considerations. The Study also provides a review of the scale, layout and locations of other P&R sites across the UK and draws comparisons between these sites and proposed Madingley Mulch of Scotland Farm locations.

Key Findings

It is recommended that **Madingley Mulch Site 4** is considered as the preferred location for a new P&R site as it provides a more favourable location with respect to:

- Being located on the preferred busway route;
- It is within a mile of both the A428 and M11 corridors;
- Has a greater catchment for existing P&R users;
- Has a good strategic fit with respect to Local Policies.

It also presents a greater opportunity for multiple modes of travel to and from Cambridge including by foot and cycle.

A review of guidance on Park & Ride (P&R) sites states that:

> *"…sites should be attractive for users and located close to a strategic road corridor…"*

The location of the existing P&R sites, within close proximity to Cambridge, have contributed to their success in that they attract trips from a wide range of origins. This is evident by their percentage occupancies and analysis of road-side interview data.

This study considered the three P&R sites under review using the following criteria:

- Alignment and Catchment;
- Preferred route;
- Trip capture;
- Journey Times;
- Distance from City Centre;
- Access for all users; and
- Site capacity.

The criteria listed above originate from policy guidance as to characteristics of a successful P&R site as well as their ability to meet the objectives of the Cambourne to Cambridge Better Bus Journeys Scheme.

1. Introduction

Atkins has been commissioned by Greater Cambridge City Deal (GCCD) to undertake further appraisal on the location of the proposed Park and Ride (P&R) site near Madingley Mulch roundabout, including a review of the proposed Scotland Farm location.

1.1. Background

In September 2016, Atkins produced an Outline Business Case (OBC) which detailed work undertaken on the Study to date and set out the Strategic, Economic, Financial, Commercial, Delivery and Management Case for the Scheme. Assessments to inform the OBC included the provision of a P&R at Madingley Mulch, however due to the early stage of scheme development a preferred site location was not presented. The OBC was presented to the City Deal board on 13th October 2013 by CCC officers. The board also considered representations and comments from stakeholders and received at public consultation.

At the 13th October board meeting The GCCD Board instructed officers to undertake further appraisal on the location of the proposed P&R site near Madingley Mulch roundabout and to consider a new proposed location at Scotland Farm as raised through representations. The decision was cited (e) (ii) as follows:

> *"ii) A new P&R at either Scotland Farm or a new location 4, which combines site 2 with the north portion of site 3, as set out in the report, with the remainder of site 3 not to be used for any P&R facilities, in accordance with the scheme design criteria set out in paragraph 12 of the report, and within established environmental and planning policies."*

Purpose of this Study

This P&R Study provides further information on the three potential locations for providing a P&R site near Madingley Mulch roundabout that were previously considered as part of the OBC for the Cambourne to Cambridge Better Bus Journeys Scheme, alongside a new proposed location at Scotland Farm. The Study outlines the planning policy, transport and environmental considerations for each site and provides an assessment of the viability of each site against these considerations.

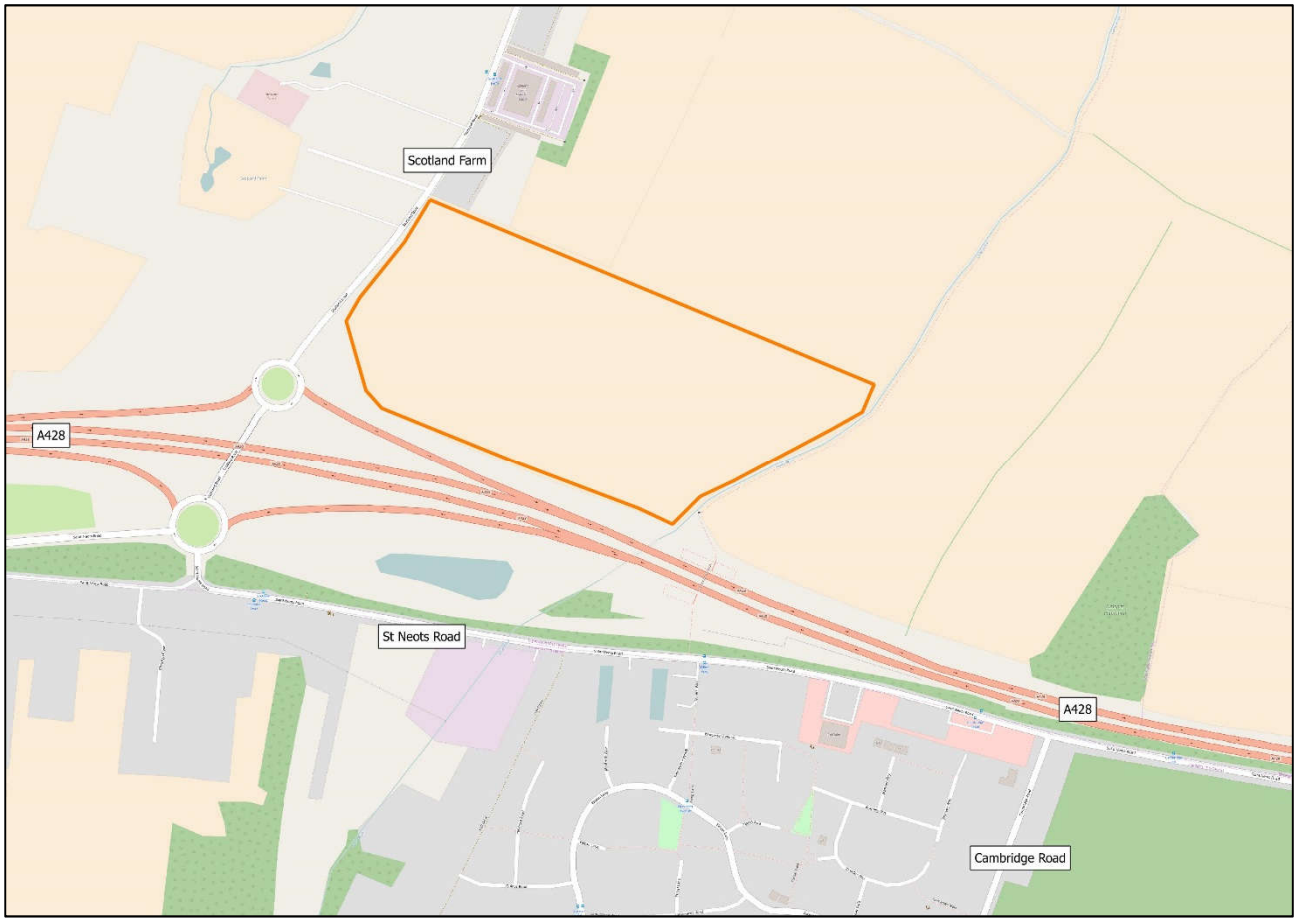
This Study should be read alongside the Outline Business Case (OBC) which provides further information on the need for a P&R site along the corridor as part of the Cambourne to Cambridge Better Bus Journeys Scheme.

1.2. Site Location

Scotland Farm

The proposed location for a P&R site at Scotland Farm is documented in material provided by Stakeholders and is presented in Figure 1-1 below:

Figure 1-1 Proposed Scotland Farm Site

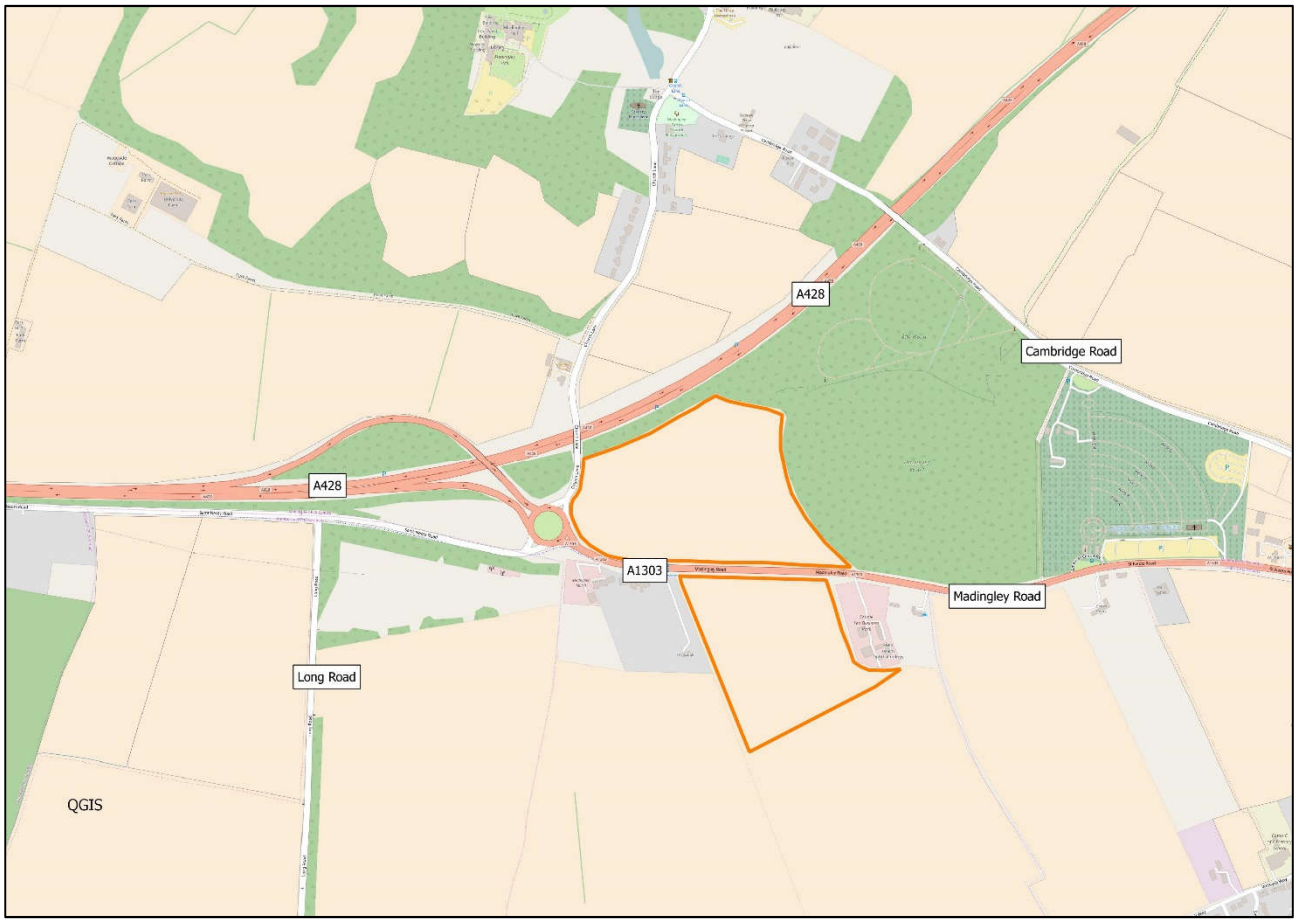


Madingley Mulch

The Strategic Case of the OBC for the Cambourne to Cambridge Better Bus Journeys Scheme presented four possible locations for the provision of a P&R site at Madingley Mulch.

The 13th October GCCD board decision identified a further site for consideration at Madingley Mulch. The proposed was given a new designation of Site 4 and comprises of a portion of site 3 combined with site 2. The proposed location of Site 4 is shown in Figure 1-2[1].

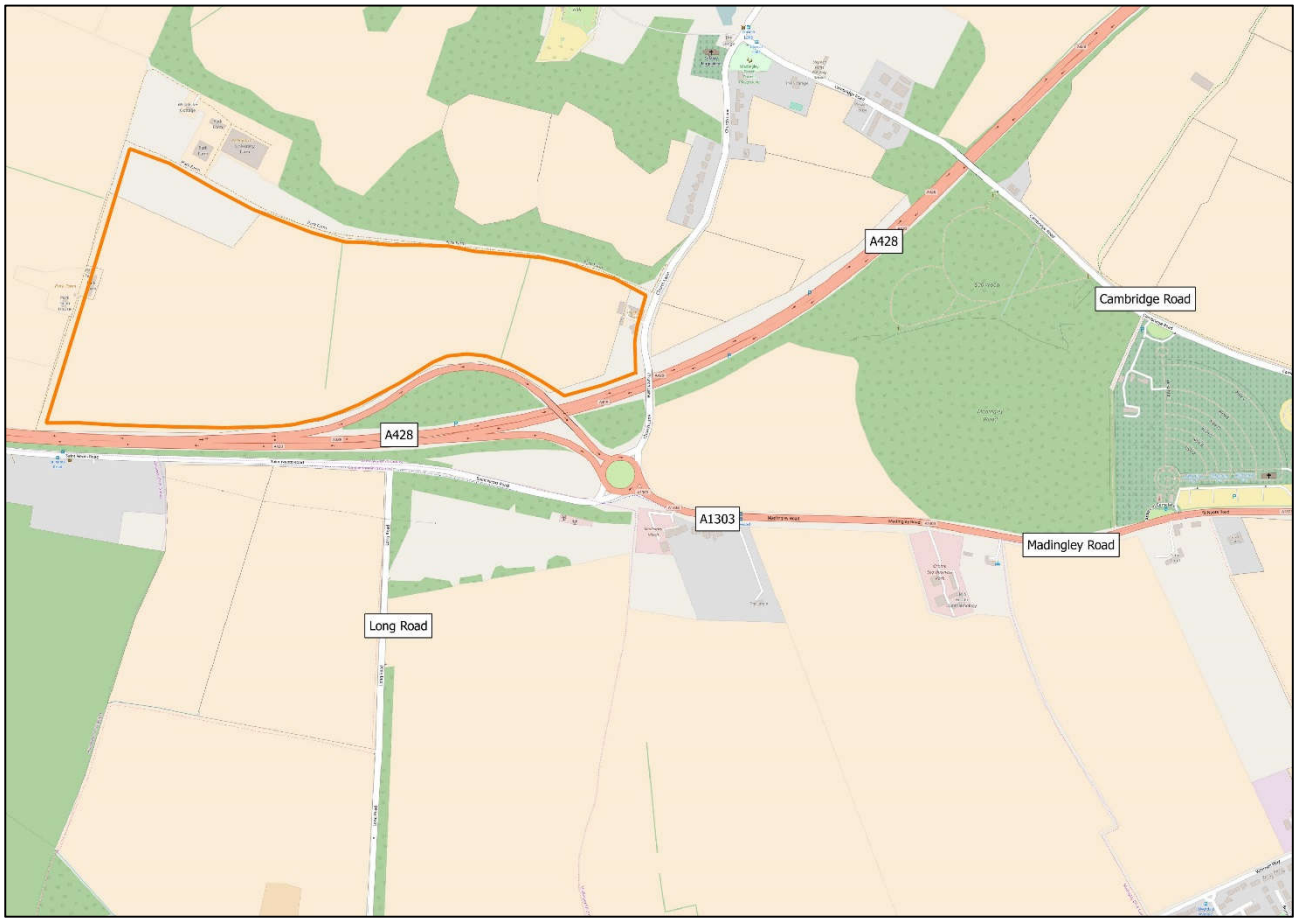
Figure 1-2 Proposed Site 4 at Madingley Mulch



In order to provide a comparison to Site 4, Site 1, as outlined in the OBC, has also been included within this P&R Study. The proposed location of Site 1 is shown in Figure 1-3 overleaf.

[1] A428 Cambourne to Cambridge Better Bus Journeys – Executive Board Report http://www.gccitydeal.co.uk/citydeal/info/2/transport/1/transport_projects_and_consultations/2

Figure 1-3 Proposed Site 1 at Madingley Mulch.



1.2.1. Preferred Scheme Options

The 13th October 2013 GCCD board decision also instructed officers to undertake further appraisal on the proposed route alignment for the Cambourne to Cambridge Better Buses Scheme as follows:

> *"Possible specific route alignments within catchment area 3a, with catchment area 3 as an alternative if option 3a proves unviable, noting that both would connect with and potentially through Cambridge West, in accordance with the scheme design criteria set out in paragraph 12 of the report, and within established environmental and planning policies" – decision (e)(i)*

This report is cognisant of the alignments 3 and 3a with respect to the siting of a P&R site on the alignment of either route.

1.2.2. Policy and Guidance

The policy and guidance that relate to this report such as the local transport plan, transport strategy and P&R guidance is appended to this report for reference.

1.3. Purpose of Study

The purpose of this P&R Study is to investigate the feasibility of proposed P&R locations at Scotland Farm and Madingley Mulch to determine which site is better located to serve the current commuters to Cambridge and the emerging preferred route for the Cambourne to Cambridge Better Bus Journeys Scheme. This Report considers the following:

- The ideal location for a new P&R site along the A428 corridor to compliment the preferred options for the Cambourne to Cambridge route;
- The evidence to support the recommended location;
- The commercial and operators view on a potential site;
- Patronage and catchment for the potential site; and
- The assumptions that underlie this assessment.

In reviewing the information and evidence in terms of benefits and constraints for each of the sites considered, this Report has provided a data led assessment of the sites and has been cognisant of the guidance and facilities related to P&R sites.

1.3.1. Assumptions

The assessment undertaken within this study has made the following assumptions:

- That routes 3 and 3a are the only alignments to be considered with respect to the P&R locations;
- Madingley Road P&R is to remain open (where it is assumed to be closed it is stated);
- Land procurement, Compulsory Purchase Order (CPO), to achieve best value;
- Operational space for bus lay-over, bus maintenance; and
- Sites subject to Environmental Impact Assessment (EIA).

1.3.2. Data Sources

Information and data has been collected from various sources and the data used within this assessment is listed below:

- Cambridgeshire Guided Busway Report (2012);
- Road Side Interviews on Madingley Road 2013;
- Atkins TN1 P&R Technical Note (2015);
- Public Consultation responses to the proposed Cambourne to Cambridge Schemes;
- P&R policy and guidance (included in Appendix A);
- 2011 Census Data; and
- A428 Cambourne to Cambridge Outline Business Case.

1.4. Report Structure

The remainder of this report is structured as follows:

- Chapter 2 summarises the supporting information and consultation responses in respect to the Cambourne to Cambridge Better Bus Journeys Scheme;
- Chapter 3 provides a summary of existing P&R sites in to determine key characteristics and performance;
- Chapter 4 assesses the accessibility of the proposed P&R sites at Madingley Mulch and Scotland Farm;
- Chapter 5 provides a summary and recommendations.

2. Supporting Information

This Chapter of the report provides a summary of the assessments undertaken to date with respect to the size, layout and location of P&R sites as part of the Cambourne to Cambridge Better Buses Scheme. This includes technical reports provided to the GCCD Board and public consultation responses received.

2.1. Draft Transport strategy for Cambridge and South Cambridgeshire

Within the Draft Transport Strategy for Cambridge and South Cambridgeshire a series of interventions were identified along the St Neots and Cambourne to Cambridge corridor as part of the strategy for that corridor. One of the interventions identified was the '*Provision of an outer Park & Ride on A428 between Cambourne and A1303*' which was part of the 'creating a HQPT corridor' strategy. Furthermore, the strategy states that '*A Park & Ride site accessed from the A428, to take advantage of the bus priority measures on the A1303 St Neots Road between the A428 and the M11'*

The strategy also describes the reason for siting the P&R site within the corridor and states that:

> *In the longer term, a busway or HQPT bus infrastructure will be introduced along the A1303 section of the corridor to completely segregate buses from other traffic. It will service a second Park & Ride site between Cambourne and the A1303, which will intercept traffic further out from Cambridge and free up more capacity at the existing Madingley Road site which would then be used principally for traffic coming off the M11.*

Figure 5.15 of the draft Transport Strategy shows a P&R site within the Bourn Airfield/Cambourne area and stated above with a primary focus of 'intercepting traffic further out from Cambridge'.

2.2. Cambourne to Cambridge Better Buses Scheme Reports

Several reports have been prepared is support of the Cambourne to Cambridge Better Bus Scheme and submitted to the Executive Board throughout the life of the project. These reports document the progression of the scheme from the 34 initial concept options, through option refinement into the 6 options presented at Public Consultation in 2015, to the final 5 options presented within the OBC. Each of the documents are summarised below, with emphasis on the considerations and feasibility of siting a P&R site along the corridor.

2.2.1. Madingley Road/A428 Corridor Study - Options Appraisal Report (June 2014)

Within the Madingley Road/A428 Corridor Study Options Appraisal Report produced in June 2014 a number of recommended options (4.46 of the OAR report) for the Cambourne to Cambridge bus scheme were presented. These options were borne out of the option sifting undertaken at an earlier stage of the project. The shortlisted options included the following:

- Option 3 including a P&R site at Caxton Gibbet;
- Option 5 including a P&R site at Madingley Mulch;
- Option 7 including a P&R site at Bourn Airfield;
- Option 8 including a P&R site at Bourn Airfield;
- Option 10 including a P&R at Caxton Gibbet;
- Either option 7 or 8 plus Option 11 which includes a P&R at Madingley Mulch.

Of these 6 recommended options, options 3 and 7 were dropped for varying reasons of deliverability (option 7) and uncertainty over intercepting a greater amount of traffic (option 3). The remaining 4

options were renamed to A (option 5), B (option 8), C (option 10) and D (option 8 and 11), and taken forward to the next phase for assessment.

2.2.2. Interim Report (June 2015)

The Interim Report produced in June 2015 reviewed the previous options with respect to the tranches as set out within the city deal funding framework. These options focused on the feasibility of a P&R site at Madingley Mulch with respect to the options tested. Scotland Farm was not considered within this assessment.

2.2.3. A428 Western Corridor Study (September 2015)

The A428 Western Corridor Study undertaken by Atkins in September 2015 and considerd three sites at Madingley Mulch for a proposed P&R site. This assessment was undertaken to inform the project team of the feasibility of siting a P&R site at or adjacent to the Madingley Mulch roundabout. The proposed sites were labelled 1, 2 and 3 and are located northwest, north and south of Madingley Mulch. The sites were assessed using various criteria such as Capacity, Accessibility, Access arrangements, land use, planning constraints, environmental impacts and traffic impacts. The assessment of the three sites provided a ranking of the sites with respect to the criteria without stating a preferred location.

2.2.4. Analysis of Public Consultation Proposals (February 2016)

Public consultation events were held in October/November 2015 which presented the proposed scheme options to the public to gauge feedback and public opinion. A P&R site at Madingley Mulch was presented within the public consultation material and 46.1% of respondents approved of a new P&R site near the Madingley Mulch roundabout with 28.3% against the suggestion. Some 45.8% had no preference to a specific P&R site location.

2.2.5. TN01: P&R Site Locations Technical Note (June 2016)

A P&R Technical Note (TN01) was produced by Atkins in May/June 2016 and submitted to the GCCD Board for their consideration. TN01 reviewed potential P&R locations to serve the Cambourne to Cambridge Better Buses Scheme (referred to within TN01 as the A428 Scheme), based on analysis of a range of criteria such as:

- Vehicle access (dedicated infrastructure / priority);
- Bus Access (segregated);
- Proximity to strategic road network;
- Ability to provide direct, fast, and reliable route options;
- Capacity;
- Associated facilities and staffing; and
- Environmental considerations.

TN01 assessed 4 locations for a P&R site including the investigation of a transport hub at the following locations:

- Madingley Mulch roundabout;
- Scotland Farm;
- North of Cambourne; and
- Transport Hubs at:
    - Cambourne;
    - Bourn;
    - Between Highfields and Caldecote.

The TN01 investigated each potential site in turn with respect to rationale, potential capacity and access arrangements. A qualitative appraisal was also undertaken which included a review of site suitability, environmental and transport impacts as well as operating costs for each site. With respect to Madingley Mulch and Scotland farm the following information was reported:

Madingley Mulch:

- **Rationale:** The congestion within the peak periods typically begins in the area around Madingley Mulch roundabout. This location is also suitable for connecting bus services to other employment hubs around Cambridge including the city centre. The Madingley Mulch location lends itself to good balance between access and operating costs.
- **Potential Capacity:** in excess of 370,000sqm with room for extension.
- **Access Arrangements:** Requires reconfiguration of the roundabout in some form.
- **Site Suitability:** Good accessibility from the adjacent highway network
- **Environmental/Transport impacts:** Landscape character will need to be considered with potential mitigation measures such as screening considered. It is expected the majority of users will already on the corridor but there may be diverted trips to the corridor from other corridors.
- **Operating Costs:** Operating costs would perform better than sites further from Cambridge.

Scotland Farm:

- **Rationale:** Put forward by Stakeholders with the intention of earlier interception of traffic along the A428
- **Potential Capacity:** The site cannot present multiple alternatives as there are constraints such as the A428 and Scotland Road and other land sues around Hardwick Junction.
- **Access Arrangements:** Potential new arm from roundabout junction resulting in more land take and reducing the area of the site.
- **Site Suitability:** Reduction in accessibility to local road network such as Church Lane and Long Road.
- **Environmental/Transport impacts:** The landscape character would need to be reviewed. With respect to transport, the future growth in the area is likely to make traffic movements on the Hardwick junction worse and therefore would have a knock on effect to the on-line buses using the P&R site.
- **Operating Costs:** Operating costs are likely to be higher at this location due to the additional distance the buses would have to travel as opposed to the Madingley Mulch site.

The TN01 also provided commentary on potential transport hubs at Cambourne, Bourn and between Highfields and Caldecote. These sites would be suitable for walking and cycling access but would reduce accessibility from the road network and potentially increase bus operating costs.

The TN01 summarised that:

> *' a P&R site situated close to Madingley Mulch roundabout would be the most suitable location, as it would offer a good balance between congestion free access, high capture of patronage, and lower operating costs'*.

The principle benefits of a site at Madingley Mulch were identified as follows:

- *"Being located as far east as possible, making it accessible to the greatest number of users;*
- *Having good accessibility from the trunk road and local road network;*
- *Achieving interception of car users at the point where congestion starts;*
- *Having the lowest likely operating costs of bus services compared to sites further west; and*
- *Having the potential for the largest land capacity for the provision of a P&R site."*

2.2.6. Options Assessment Report for Cambourne to Cambridge Better Bus Journeys (October 2016)

The Options Assessment Report (OAR) undertaken by CCC describes the process by where the final 5 options for the scheme where taken forward to be included within the OBC. Options for P&R sites

along the corridor were also presented, in figure 4 within the report. Figure 4 shows the sites 1, 2 and 3 at Madingley Mulch.

Paragraph 62 from the OAR states

'*For the purposes of strategic modelling a specific location for the proposed P&R near Madingley Mulch roundabout was assigned. It was considered reasonable that a single location with potential capability for any Option would be sufficient for strategic level appraisal as such Site 2 was selected. It was acknowledged that the offline route to the south would require buses to cross over Madingley Road twice), and would provide the easiest access for the majority of vehicles in the AM peak. This site was deemed to be the most flexible and therefore taken forwards for the appraisal*

Paragraph 63 from the OAR states:

'The constraints for the location of the Park & Ride are the similar as those for the linear options. The key strategic consideration of the P&R location is the extent to which it operates effectively with each option'

The summary of the options as described within the OAR are '*5 Options and 3 Park & Ride location in the vicinity of Madingley Mulch Roundabout were taken forward for further assessment.'*

2.2.7. Outline Business Case

The Outline Business Case (OBC) for the Cambourne to Cambridge Better Buses Scheme was produced by Atkins in September 2016 and sets out the Strategic, Economic, Financial, Commercial and Management Case for the scheme. The OBC considered a new P&R site at Madingley Mulch roundabout for all options without specifying which site was preferred. No other locations for P&R provision were considered.

The Strategic Case set out the strategic and policy context for the Scheme. This included identifying the primary benefits of the existing Madingley Road P&R site provides, these include:

- A 'turn-up and go' frequency of 10 minutes;
- 45% capture of passing traffic heading into Cambridge; and
- Traffic captured from the A1303 and M11.

The characteristics identified above have led to the success of the P&R site at Madingley Road as the site is nearing capacity[2]. The site will continue to operate at full capacity which is the main factor that an alternative site is being investigated.

2.3. Environmental Assessment of Sites

Initial environmental assessment was conducted as part of the Economic Case within the OBC at a level commensurate with the preparation of the case. A full Environmental Impact Assessment (EIA) will be required as the project progresses. Two specific disciplines identified environmental impacts associated with a proposed P&R site at Madingley Mulch:

- **Drainage** – impacts associated with drainage such as surface run off caused by hard surfaces can be reduced to negligible through sustainable drainage solutions; and
- **Landscape** – a P&R site at Madingley Mulch is considered to have small scale localised impact on overall access character. There are opportunities to mitigate the impacts and integrate the proposal into the landscape through careful consideration of the layout and

[2] TN01 – Park and Ride Locations – 28th September 2015 - http://www.gccitydeal.co.uk/citydeal/info/2/transport/1/transport_projects_and_consultations/2

design of the site, including the retention of boundary vegetation and limiting the height of the lighting proposals.

The environmental assessment concluded that a P&R site at Madingley Mulch could be accommodated with appropriate mitigation.

2.4. Public/Stakeholder Consultation Responses

2.4.1. Cambridge BOLD Report

A report was prepared by CambridgeBOLD in November 2015 which addressed the proposed Cambourne to Cambridge Better Bus Journeys scheme (referred to as the A428 Cambourne to Cambridge Busway within the report). CambridgeBOLD is a group which was formed in October 2015 to provide a response to the Greater City Deal Executive Board's public consultation. The report suggested 6 recommendations for the A428 Cambourne to Cambridge busway, to which one item related to a P&R site:

"Build a new P&R at the A428/Scotland Road roundabout".

CambridgeBOLD provide the following justification for siting a P&R site at Scotland Farm:

- Good connectivity to the A428, St Neots Road, Dry Drayton, Hardwick;
- Cycle/foot access to and from Hardwick via blue bridge and Dry Drayton via existing Public Right of Way (PROW);
- Site can accommodate a hotel to encourage layover trip making;
- Site to include convenience store for site users;
- Coach layover – for long distance services; and
- Referred to as Transport Hub.

Furthermore, the CambridgeBOLD report also includes a number of points as to why Madingley Mulch roundabout is not considered suitable for a P&R site, which included the following:

- The roundabout is very busy, with a difficult layout;
- It is too close to Madingley Hill, a traffic congestion hot-spot we are all trying to avoid;
- It is too far from the largest centre of population in the immediate area, i.e. Hardwick;
- Long-distance traffic coming along the A428 from the west (e.g. from Milton Keynes, Bedford or St Neots) exits the A428 unnecessarily late; it would be better if such traffic could be captured earlier;
- Long-distance traffic coming along the A14 from the east (e.g. from Newmarket, Bury St Edmunds, Felixstowe etc) can't exit to Madingley Mulch; but it can continue on the A428 and exit at Scotland Road;
- Madingley Mulch is too small an area to become a true public 'Transport Hub' (i.e. not enough room for a hotel, petrol station, shop, public toilets etc);
- The area is very sensitive, being at the top of Madingley Hill, with its important views and location;
- We worry about the effect of car emissions, as they enter/exit a P&R and park their cars, on the ecology of Madingley Old Wood, a Site of Special Scientific Interest (SSSI); and
- There would be too much harmful impact on the nearby villages of Madingley and Coton.

2.5. Parish Council Responses

2.5.1. Introduction

Following the submission of P&RTN01 official responses have been received from local parish councils relating to the proposed Cambourne to Cambridge Better Buses Scheme (referred to as the A428 scheme) and the siting of a new P&R site. This Section reviews those responses from Madingley, Dry Drayton and Coton Parish Councils.

2.5.2. Madingley Parish Council

Madingley Parish Council (MPC) provided their response to the proposals for siting the P&R site at Madingley Mulch and Scotland Farm. Their response noted that:

- Firm evidence should be provided that a P&R site is required to support the scheme;
- P&R at Bourn Airfield or Cambourne would be better than one located at Madingley Mulch;
- Scotland Farm is preferred site because:
  - There is four way access to site is available without environmental impact;
  - It would not contribute to congestion at Madingley Mulch;
  - To reach a site at Madingley Mulch villagers of Madingley would need to go away from the City Centre; and
  - Commuters are aware of traffic issues on Madingley Road;
- A P&R at Madingley Mulch is not preferred because:
  - Madingley Wood (SSSI) would be impacted;
  - The proposed site will have large environmental impact;
  - No environmental monitoring is included within the proposal; and
  - Traffic levels would increase through the village to access the P&R site; and
  - The location of the site will mean light will not be screened;
  - Prominent landmark in very sensitive site.

2.5.3. Dry Drayton Parish Council

Dry Drayton Parish Council (DDPC) provided their response to the proposals for siting a P&R site at Scotland Farm, with some consideration of a site at Madingley Mulch. The following points summarise their response:

- DDPC raise concerns about a new busway through well-established woodland;
- Rejects the proposed building of a P&R site at Scotland Farm/A428 and can see no benefit to residents of Dry Drayton;
- Such siting would have the potential of diverting even more traffic off the A14 through Dry Drayton thus having a detrimental effect on the village;
- The upgrading of the Dry Drayton to Hardwick footpath would be of no benefit to Dry Drayton residents who commute to Cambridge by bike; and
- Impact on Scotland Road residents would be significant.

2.5.4. Coton Parish Council

Coton Parish Council have not submitted a formal response to the proposed location of the P&R sites but have been minded to support CambridgeBOLD which supports the P&R location at Scotland Farm. This support was evident within their presentation submitted to CCC officers.

2.6. Summary of Supporting Information

This Chapter of the report has provided a review of the supporting documentation, provided through technical reports and consultation responses, for the provision of a P&R site at Madingley Mulch or Scotland Farm of part of the Cambourne to Cambridge Better Buses Scheme. The benefits and constrains for each of the sites (as identified by the supporting documentation only) are as follows:

Madingley Mulch

- Benefits:
  - Good access (Atkins);
  - Greater catchment of users (Atkins);
  - Located on well used route (Atkins);
  - Low operating costs (Atkins); and
  - Good Capacity (Atkins).
- Constraints:
  - Environmental impact (MPC);
  - Traffic increase through villages (MPC);
  - Local sensitivity to SSSI (MPC/CambridgeBOLD); and

- Roundabout very busy (CambridgeBOLD);

Scotland Farm

- Benefits:
  - Good connectivity to A428 (CambridgeBOLD);
  - Good connections to PROW (CambridgeBOLD);
  - Less congestion (MPC);
  - Could provide other development (CambridgeBOLD); and
  - Space for Coach Layover (CambridgeBOLD).
- Constraints:
  - Diverts traffic through Dry Drayton (DDPC);
  - Significant Impact on Scotland Road (DDPC);
  - Removed from the A14 and M11 road network (Atkins); and
  - Further west from Cambridge (Atkins).

3. Assessed Park & Ride Sites

This Chapter provides a review of the transport planning benefits and constraints of siting a new P&R at either Madingley Mulch or Scotland Farm as part of the Cambourne to Cambridge Better Buses Scheme, building upon the evidence base presented in in the previous chapters and previous studies. The Chapter assesses the sites in terms of transport accessibility, proximity to likely catchment and capacity. The review has been cognisant of the various factors that determine a good location for a P&R site. These factors are taken from the policy and general guidance and are as follows:

- Alignment and Catchment;
  - Proximity to adjacent highway network – A428 corridor and Strategic Road Network (SRN);
  - Proximity to the preferred Cambourne to Cambridge Better Bus Journeys alignment;
  - Trip capture and journey times;
  - Distance from City Centre;
- Access to the site by all modes of transport, and
- Site Capacity.

3.1. Alignment and Catchment

The alignment of the proposed corridor between Cambourne and Cambridge is shown in Figure 3-1 below with respect to the three P&R sites considered:

Figure 3-1 Cambourne to Cambridge Corridor with 'Best Fit' alignment

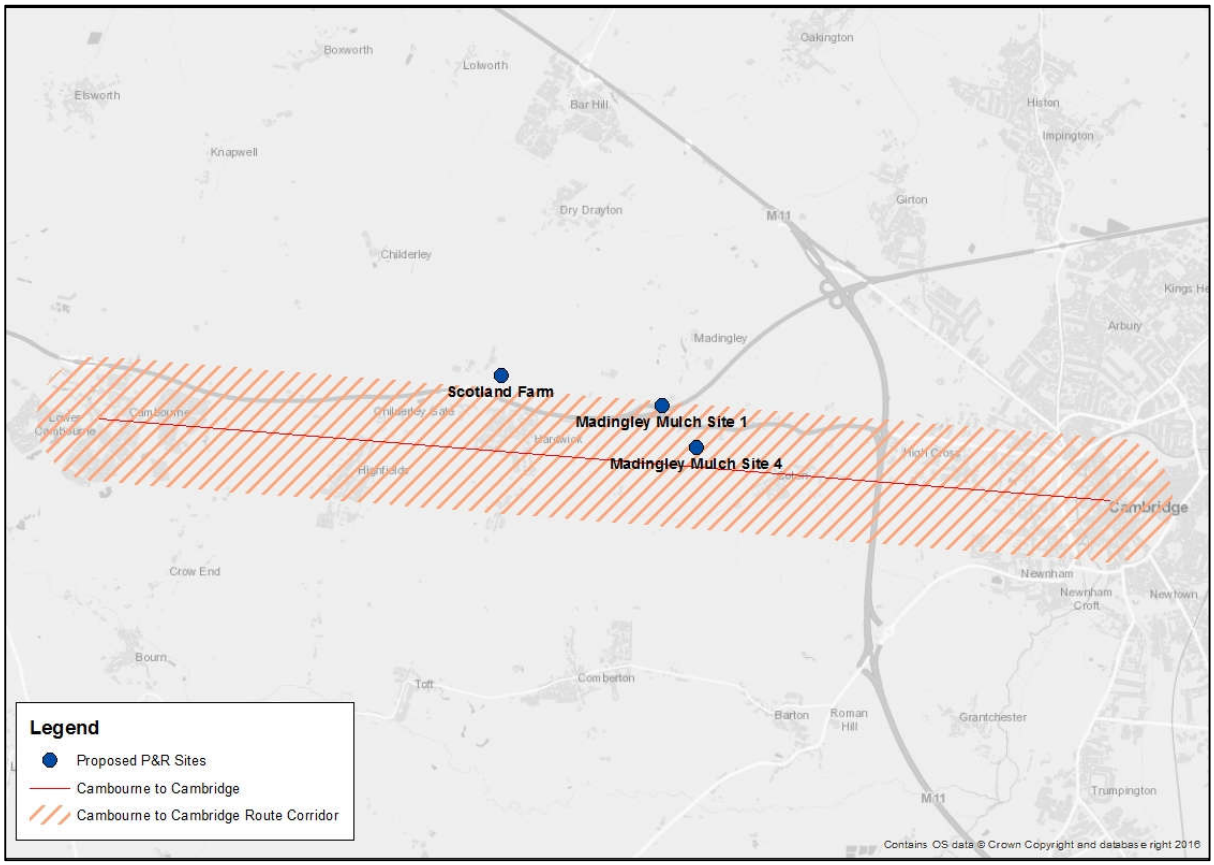


Figure 3-1 shows the best fit alignment between Cambourne and Cambridge and indicates the area within which the preferred routes currently are located.

3.1.1. Route Alignment

The alignment of the Cambourne to Cambridge bus scheme is in line with the draft transport policy of providing a HQPT off line busway along the A428/A1303 corridor. The location of Cambourne to the west of Cambridge provides a geographical alignment between the conurbations to the south of the A428 and the A1303. In order to achieve the fast, frequent and reliable service the route should aim to be a short as possible. The route, and location of the Park & Ride site should aim to sit on that alignment and intercept as much traffic as possible and so should be sited in an area with a maximum catchment to incoming streams of traffic.

It is considered that the sites at Madingley Mulch have the most potential to intercept trips as they lie on the A1303, and close to the junctions with the A428 and M11 for access to Cambridge whereas the Scotland Farm site has potential to intercept trips from the A428, St Neots Road and Scotland Road.

3.1.2. Proximity to Local Road Corridors

The distance and proximity of the Madingley Mulch and Scotland Farm sites from respective road corridors and destinations is given in Table 3-1:

Table 3-1 Distances to Key Roads and Settlements (miles)

Destination/Origin:	Scotland Farm	Madingley Mulch – S1	Madingley Mulch – S4
M11	4.8km (3.0 miles)	3.4km (2.1 miles)	2.4km (1.5 miles)
A428	160m (0.1 miles)	500m (0.3 miles)	160m (0.1 miles)
A14	4.3km (2.7 miles)	4km (2.5 miles)	3km (1.9 miles)
A1303 – Madingley Road	2.7km (1.7 miles)	500m (0.3 miles)	0km (0 miles)
Cambridge City Centre	11.1km (6.9 miles)	8.4km (5.2 miles)	7.4km (4.6 miles)
Cambourne – Centre	4.8km (3.0 miles)	6.4km (4 miles)	7.4km (4.6 miles)

Note: S1 = Site 1; S4 = Site 4.

Accessibility to the local highway network is important for capturing patronage and drivers already on those particular routes. The previous TN01 discussed the accessibility of the sites assessed with respect to capturing traffic from as many routes as possible. The relative distances of Scotland Farm and the Madingley Mulch sites are discussed below:

Scotland Farm

The location of the Scotland Farm site is closer to Cambourne and is approximately 1,600m from the A428. The proposed site is some 4.3km (2.7miles) from the Strategic Road Network (SRN) and some 4.8km (3 miles) from the M11 radial route to the west of Cambridge. The site is also 11.1km (6.9miles) from Cambridge City Centre but is not located immediately adjacent to one of the direct routes into Cambridge. The location of this site has the propensity to not capture as many likely users as it is offline and unseen from the A428.

Madingley Mulch Roundabout

Site 1

The location of the Madingley Mulch site 1 is 3.4km (2.1 miles) from the M11, 8.4km (5.2 miles) from the City Centre and is located adjacent to the A428 eastbound off-slip. This site is located well with respect to the A428 but for cars travelling on the A1303, Chapel Lane or Long Road the site is further removed from their corridors and would require a detour from those routes.

Site 4

The location of the Madingley Mulch site 1 is 2.4km (1.5 miles) from the M11, 7.4km (4.6 miles) from the City Centre and is located adjacent to the A1303, Madingley Road. The location of this site is on the alignment of the A1303/A428 corridor and the preferred options, it also is well located for the local

highway network and has the opportunity to attract trips from the M11 too. The location of this site from Cambridge is likely to see lower operating costs for the bus companies which was discussed in earlier reports.

3.1.3. Proximity of the Proposed Sites to the Preferred Route Options

The distance and proximity of the Madingley Mulch and Scotland Farm sites from the chosen preferred routes is given in Table 3-2 below:

Table 3-2 Distances to Preferred Routes (miles)

Destination/Origin:	Scotland Farm	Madingley Mulch – S4	Madingley Mulch – S1
Route 1 – online option	160m (0.1 miles)	160m (0.1 miles)	160m (0.1 miles)
Route 3	1.6km (1 mile)	160m (0.1 miles)	660m (0.4 miles)
Route 3a	400m (0.25 miles)	160m (0.1 miles)	660m (0.4 miles)

For the preferred options that re currently being considered it is important that the proposed P&R site is online with these routes or within the agreed swathe of the routes. The three options being tested through this stage of the project include an online option, route 3 and route 3a. These preferred routes are discussed below with each proposed site.

Scotland Farm

The location of the Scotland Farm site is within 1,600m of the online option, 400m from option 3a and 1.6km from the preferred option 3. For each of the three options Scotland Farm does not sit on their respective alignments and so requires the buses to divert off their routes to access the site and in the case of route 3 this is a 3.2km roundtrip to the P&R site and back to the busway. The online route provides the least distance for the bus with the route 3a requiring the bus to drive an additional 800m on road to access the P&R site at Scotland Farm.

Madingley Mulch – Site 1

The location of the Madingley Mulch site 1 is situated within 660m of the assessed route alignments for the option 3 and option 3a. The site 1 is located adjacent to the proposed online option. For the route 3 and 3a options the bus would be required to travel a further 1.2km to access a P&R at site 1.

Madingley Mulch – Site 4

The location of the Madingley Mulch site 4 is situated within the assessed route alignments for the online option, option 3 and option 3a. This site would not require additional time and distance for the bus services to access the P&R site as the site sits within the alignments.

Summary of Proximity to Preferred Routes

The proposed Cambourne to Cambridge busway is proposed to be a HQPT which is fast frequent and reliable. In that respect, siting a P&R on the alignments of the options being considered is a logical choice as it does not require the buses to travel on lengthy detours to reach the P&R site and saves time and distance travelled which ultimately reduces operating costs too.

3.1.4. Trip Capture

Ideally a park and ride site should be located where it maximises the capture of car trips on the highway network. The likely catchment of the Madingley Mulch sites 1 and 4 and Scotland Farm sites for potential users has been derived from Roadside Interview (RSI) data recorded in 2013 on Madingley Road. The data was reviewed and only data that related to people using the Madingley Road P&R site was used within this assessment. The data is not included within this report due to confidentiality issues.

The RSI data recorded existing users of the Madingley Road P&R site, their starting post code and destination postcodes with Madingley Road P&R as the intermediate destination to catch a bus. The data was assessed using a GIS program with the postcode data and investigating the likelihood of diverted trips to the three possible P&R locations if Madingley Road P&R were to close. The results of the RSI assessment are as follows:

Madingley Mulch – Sites 1 and 4

From the RSI data analysis, some 83% of cars currently using Madingley P&R are likely to transfer to a site at Madingley Mulch if Madingley P&R were to close. The site would capture 100% trips from the A428 corridor and approximately 50% of those originating from the M11 corridor. This equates to a total of 947 trips transferring to Madingley Mulch and 197 finding another means to access their destination.

If the existing Madingley Road P&R stays open, then the M11 users would continue to use the existing site and the majority of the users who travel along the A428 would use Madingley Mulch sites 1 or 4 to avoid queuing along Madingley Road at junction 13 during the peak periods.

Scotland Farm

From the RSI data analysis, some 64% of trips currently using Madingley P&R are likely to transfer to Scotland Farm. It is unlikely that existing trips travelling up the M11 to Madingley P&R would transfer to Scotland Farm. Furthermore, all trips except from villages such as Madingley and Coton, which equates to 35 trips, on the A428 corridor are likely to transfer to Scotland Farm. This equates to a total of 715 trips transferring to Scotland Farm and 429 finding another means to access their destination.

If the existing Madingley Road P&R stays open, then the M11 users would continue to use the site.

Summary of Trip Capture

A P&R site at Madingley Mulch at either site 1 or site 4 is likely to capture more existing P&R user trips than Scotland Farm due to its proximity to the M11 and being adjacent to the incoming A1303 corridor.

3.1.5. Journey Times

To achieve a fast, frequent and reliable service consistent journey times are paramount. The preferred routes will dictate specific journey times between the stops and Cambourne and Cambridge. The location of the P&R site on the routes should be introduced to minimise delay as much as possible. In considering the location of the P&R site on journey times an average Cambourne to Cambridge journey time undertaken by the Citi 4 service was assumed and the effect on this journey time for the proposed P&R sites is described below:

Scotland Farm

The location of Scotland Farm requires a deviation from the preferred routes by some 1,600m for route 3 and 400m for route 3a. This deviation could add in excess of 8% on to the journey times of the services. There is also the added prospect of the services being held up by local traffic whilst making this diversion and thus incurring further delay to journey time.

Madingley Mulch – Site 1

The location of Madingley Mulch Site 1 requires a deviation from the preferred routes by some 660m for route 3 and 3a. This deviation could add in excess of 8% on to the journey times of the services.

Madingley Mulch – Site 4

The location of Madingley Mulch Site 4 is located on the preferred routes and the only delay caused to the journey times is expected to be minimal and in relation to the service sopping to pick up and drop off passengers.

Summary of Journey Times

A P&R site at Scotland Farm would compromise the 'fast' element of the proposed busway as the journey times would increase due to more remote access from the considered alignments. The Madingley Mulch site 1 would also add to the journey times of the proposed busway services whereas the Madingley Mulch site 4 provides the site that would cause minimal delay to the proposed busway service.

3.1.6. Distance from City Centre

The location of the proposed P&R sites with respect to the city centre are as follows:

- Madingley Mulch site 1 - 8.4km (5.2 miles);
- Madingley Mulch site 4 - 7.4km (4.6 miles); and
- Scotland Farm - 11.1km (6.9 miles).

As discussed in the earlier P&R study (TN01), there are certain aspects of the location of a P&R that are considered related to the distance of the site from the city. One of those aspects is bus operation costs and the closer to the local highway network and the city there is a benefit of reducing operating costs. Another aspect is accessibility from the local highway network and Madingley Mulch presents a location that captures traffic from Chapel Lane and Long Road as well as the A1303 and A428.

3.2. Site Access

3.2.1. Vehicular Access

The access to these sites were reviewed within TN01, this assessment provides a similar assessment and considers pedestrian and cycle access too. Access to the site compliments the accessibility of the site for predominantly car drivers but for all users too. Each site is considered below.

Scotland Farm

The proposed Scotland Farm site lies north of the A428 and east of the Scotland Road adjacent to the Hardwick Interchange on the A428. The proposed site abuts Scotland Road from which it could take access. Scotland Road is a two-way single carriageway road which connects the A428 to the village of Dry Drayton. There is an existing footway to the east of Scotland Road which runs between Hardwick and Scotland Farm. The increase in traffic on Scotland Road which is associated with the park and ride site may cause congestion and disruption to existing users during peak periods. This disruption and congestion could have a knock on effect to vehicles using the eastbound off slip from the A428.

Madingley Mulch – Site 1

The proposed Madingley Mulch site 1 lies north of the A428 and the eastbound off-slip from the A428. The site is some 500m west of the Madingley Mulch roundabout. There is no current access into the site from the A428 or the off-slip. The off-slip is one way so any access into the site from the off-slip would be for eastbound journeys only. Access for other users would have to be provided elsewhere.

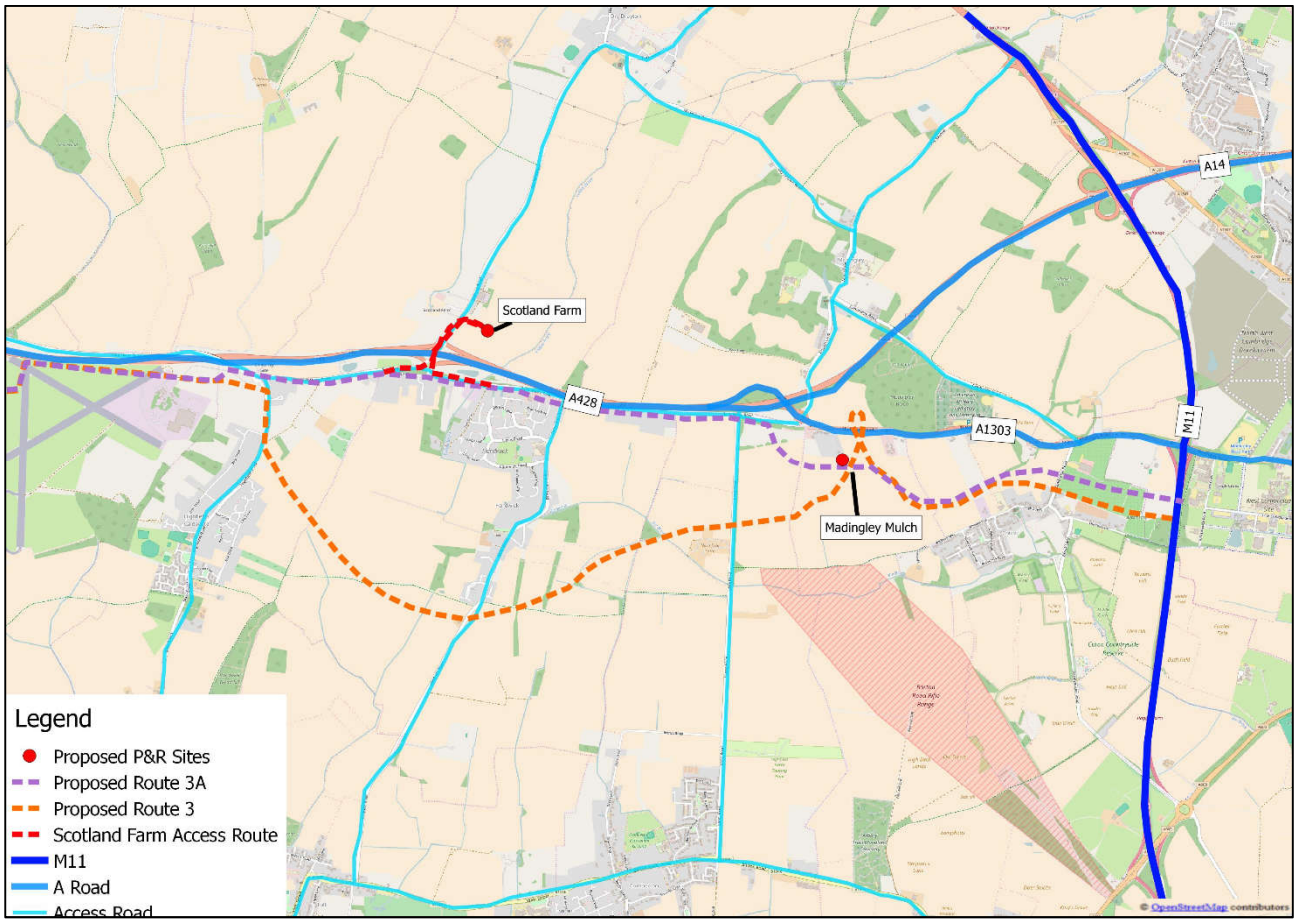
Madingley Mulch – Site 4

The proposed Madingley Mulch site straddles Madingley Road (A1303) to the east of the Madingley Mulch roundabout. The A1303 runs between the Madingley Mulch roundabout and the A1134 (Ring

Road) in Cambridge. Madingley Road is a two-way single carriageway road and has a footway to the southern side of the road as it passes the site. There is an opportunity to access a P&R site directly from the A1303 in this location and provide additional capacity for the Madingley Mulch roundabout.

Figure 3-2 shows the location of both proposed P&R sites in proximity to the existing highway network.

Figure 3-2 Location of Proposed P&R Sites in Relation to the Existing Highway Network



3.2.2. Pedestrian and Cycle Access

Scotland Farm

As previously discussed, there is an existing footway that runs between Scotland Farm and Hardwick across the Hardwick Interchange with the A428. This footway provides good pedestrian access to the site. Cyclists can access the site by road. There is an existing PROW to the east of the site which provides a connection by foot, over the A428 to Hardwick.

Madingley Mulch – Site 1

There are no cycle routes or PROW's that run adjacent or to the Madingley Mulch Site 1. The nearest footway is at the Madingley Mulch roundabout some 500m east of the site.

Madingley Mulch – Site 4

There are cycle routes that run adjacent to St Neots Road and Highfields Road providing a route into Cambridge. These routes pass the Madingley Mulch site and would provide cycle access to any

proposed P&R site. The existing footways along Madingley Road provide connections between existing conurbations and the proposed site.

3.2.3. Cycle Access to Cambridge

Scotland Farm

The proposed Scotland Farm site is some 6km from the West Cambridge site and furthermore, some 8km from Queens Road making it a large distance over which cyclists could travel. It is considered unlikely that people would park at a potential Scotland Farm P&R site in order to cycle to Cambridge.

Madingley Mulch – site 1

The proximity of the Madingley Mulch site 1 to Cambridge could lend itself for potential cycle trips along the eastbound off-slip, along Madingley Road and along the proposed busway. The Madingley Mulch site 1 is located within 4km of the West Cambridge site and within 6km of Queens Road (The Backs) which place those destinations within cycling distances from the site.

Madingley Mulch – site 4

The proximity of the Madingley Mulch site 4 to Cambridge lends itself for potential cycle trips along the proposed busway. The Madingley Mulch site is located within 3km of the West Cambridge site and within 5km of Queens Road (The Backs) which place those destinations within acceptable cycling distances from the site.

3.2.4. Summary of Site Access

Madingley Mulch Site 4 is ideally located to facilitate access from the local highway network with relative ease with respect to site 1 and Scotland Farm. Access could be provided for vehicles which compliments the A1303 and provides a level of control which can assist in the managing of local congestion along the corridor which is experienced in peak periods. Furthermore, access to Cambridge by those wishing to park and cycle would be greatly improved by locating a P&R site at Madingley Mulch.

3.3. Proposed Site Capacity

Within TN01 the size of the sites were reviewed and in with respect to the GCCD board decision of October 13th 2016, this assessment has revisited the approximate sizes of the considered Madingley Mulch sites 1 and 4, and the Scotland Farm site which are given below. The Madingley Mulch site 4 has been presented splitting the site north and south of the A1303 for information.

- Madingley Mulch site 1 – 20.5 ha (50.6 acres);
- Madingley Mulch site 4 - 20.6 ha (50.9 acres);
    - Portion of site north of Madingley Road (A1303) – 11.3ha (27 acres);
    - Portion of site south of Madingley Road (A1303) – 7.3ha (18 acres); and
- Scotland Farm - 9.7ha (24 acres)

The potential capacity of the proposed sites to accommodate parking areas and associated infrastructure, and facilitate buses has been derived from the existing areas of the Cambridge P&R sites. The total areas of the sites and car park areas have been measured to give an approximate average ratio of developed area to landscaped area. For the Cambridge P&R sites this ratio is 39%. The calculations of this ratio are presented in the Appendices. Car parking ratios have been derived from the existing P&R sites at a ratio of 1 space per 31sq.m. The derived ratios have been applied to the Scotland Farm and Madingley Mulch sites to give the following capacities:

Table 3-3 Likely Capacities of Proposed P&R Sites

Site	Total Area (Ha)	Total Area (sqm)	Developable area = 39% (sqm)	Car Parking Capacity (spaces)
Madingley Mulch Site 1	20.5	205,000	80,801	2,606
Madingley Mulch – Site 4	20.6	206,000	81,195	2,619
North of A1303	11.7	117,000	45,630	1,471
South of A1303	9.2	92,000	35,880	1,157
Scotland farm	9.7	97,000	38,232	1,233

NOTE: The % of developable area has been derived from the ratio of land to parking areas of existing P&R sites in Cambridge and Cambridgeshire.

Madingley Mulch sites 1 and 4 provide the greater capacity for spaces and site infrastructure than the Scotland Farm site.

3.4. Environmental

Previous studies have conducted high level environmental assessments of the Madingley Mulch sites and have concluded that a P&R site at Madingley Mulch could be accommodated with appropriate mitigation. The environmental considerations have been included in the table within the summary section of this report.

4. Summary and Recommendation

4.1. Summary

This study has presented information that relates to the proposed Madingley Mulch and Scotland Farm sites and whether they are more suited to accommodate and operate a new P&R site. This study has collated background information such as policy guidance, RSI data and assessments of existing P&R sites to provide an overview of the site that is best placed to facilitate the Cambourne to Cambridge Better Bus Journeys busway. The table below provides a Red, Amber, Green (RAG) classification for each site in relation to each criteria where Red = poor; Amber = average and Green = good for each criteria. Scores have also been attributed to each criteria based on the RAG scale of Red = 1, Amber = 2 and Green = 3.

Table 4-1 P&R Site Comparison

Criteria	Madingley Mulch Site 1	RAG	Madingley Mulch Site 4	RAG	Scotland Farm	RAG
Size / Capacity	20.5 ha = up to 3,040 spaces	3	20.6 ha = up to 3,054 spaces	3	9.7ha = up to 1,438 spaces	2
Proximity to City Centre	8.4km	2	7.4km	2	11.1km	2
Catchment	83% transfer trips from Madingley Road P&R	3	83% transfer trips from Madingley Road P&R	3	64% transfer trips from Madingley Road P&R	2
Access for cars	Access from A428 eastbound off-slip	3	Access from A1303 and a428 is direct	3	Access from Scotland Road and A428 is direct	3
Access for buses	Close proximity to road corridors	3	Close proximity to road corridors	3	Close proximity to road corridors	3
Facilities for Park and Cycle	Site close to Cambridge to possibly encourage parking and cycling from the site	2	Site close to Cambridge to possibly encourage parking and cycling from the site	2	Does not provide opportunity for parking and cycling to the city centre	1
Route compatibility with options	Site is 660m offline of preferred option	2	Site sits within swathe for preferred option	3	Site is 400m offline from preferred option	2
Relocation of Patronage	Likely to capture 100% of existing A428 trips to Madingley Road P&R	3	Likely to capture 100% of existing A428 trips to Madingley Road P&R	3	Likely to capture 63% of trips currently using A428 corridor to access Madingley Road P&R	2
Policy compliance	Good proximity to road network, further out from the city, not visually present on A428.	2	Good proximity to road network, radial route, visual presence on A1303	3	Good proximity to road network, further out from the city, not visually present on A428.	2

Consultation Feedback	Dry Drayton PC in favour of locality around Madingley Mulch.	2	Dry Drayton PC in favour.	2	Madingley PC in favour	2
Totals		**25**		**27**		**21**

4.2. Recommendation

Based on the information and analysis presented in this study it is recommended that **Madingley Mulch site 4** is considered as the preferred location for a new P&R site as it provides for a more favourable location with respect to policy, location, catchment, distance and accessibility. It presents an opportunity for multiple modes of travel to and from Cambridge such as cycling, walking and bus travel.

Appendices

A.1. Policy Appraisal

This Chapter identifies the national and local policy guidance relevant to the development of a P&R site as well as P&R specific policy guidance.

A.1.1. National Policy

Planning Policy Guidance 13: Transport

The National Planning Policy Guidance (PPG) Chapter 13 provides guidance on the location and design of P&R sites. It states that '*schemes should be designed for used by disabled people, and to promote the potential for walking, cycling and motorcycle journeys to and from the site. They should also be designed and operated in order to maximise safety in the area and for those using the schemes'*. PPG13 also considers the location of P&R sites in the Greenbelt stating that 'in some circumstances, P&R schemes may be permissible in the Greenbelt, where assessment shows such locations to be the most sustainable of the available options'. This is in line with the advice in the National Planning Policy Framework (March, 2012).

A.1.2. Local Policy

Cambridge Local Plan (2014): Proposed Submission (July 2013)

Cambridge Local Plan sets out measures to meet the development needs of Cambridge to 2031. The Plan highlights areas of major change including West Cambridge. Any development proposals for the major growth areas, should '*include provision for the extension of the existing conventional bus services, the CGB and P&R services to meet the needs of the resident and working populations'* (Policy 16: Cambridge Biomedical Campus).

Potential for new and/or extended P&R sites around Cambridge would help accommodate for the additional residential and employment trips that are likely to be generated by the major growth areas in Cambridge, within this policy aim.

Local Transport Plan 3 (2011-2031) (July 2015)

The Third Cambridgeshire Local Transport Plan (LTP) sets out the transport objectives, policies and strategy for the county. The LTP makes direct reference to the capacity constraints of the existing P&R sites:

'Owing to the popularity…some of our P&R sites are now operating close to capacity. As part of the Transport Strategy for Cambridge and South Cambridgeshire we plan to expand or relocate some of the existing sites…In addition we will provide new sites targeted at promoting travel options for residents of the major new settlements that are planned in the county, such as Bourn Airfield, Cambourne West and Waterbeach New Town.'

Long Term Transport Strategy (July 2015)

The Long Term Transport Strategy for Cambridgeshire is part of a suite of documents which make up the LTP. The vision of the Long Term Transport Strategy is that *'more traffic will access rural hubs or P&R sites for efficient reliable onward travel to key destinations'*. A number of transport schemes are highlighted as being required in order to achieve the vision, including the A1303/A428 corridor outer P&R Capacity – one more P&R or rural interchange site accessed from the A428 to take advantage of the bus priority measures on the A1303 between the A428 and M11.

Cambridge City and South Cambridge Transport Strategy (March 2014)

Also making up part of the LTP, the Cambridge City and South Cambridge Transport Strategy (TSCSC) aims to allow for:

- Extra capacity for traffic to travel around the outskirts of Cambridge, so that road space into and across the City can be prioritised for buses, cyclists and pedestrians;
- Additional P&R options on the fringes of Cambridge, to reduce the amount of unnecessary traffic travelling through the City;

- Ensuring that public transport, walking and cycling are the best ways of getting around and across the area, since they will be quicker and more convenient than by car;
- Reducing car traffic by using a variety of techniques, which may mean limiting the available road space for cars;
- Enabling people to use public transport for at least some of their journey into Cambridge or surrounding towns, by creating a frequent, quality service across major routes; and
- Developing local transport solution with communities, which link to public transport along key routes;

The TSCSC presents an Action Plan to ensure that local councils plan together for sustainable growth and continued economic prosperity. This includes changes to the existing provision of P&R sites which have *'been a cornerstone of the approach to managing demand for road space in Cambridge for almost two decades'.* The sites have been highly successful at intercepting car journeys that otherwise would have continued into the City Centre, adding to congestion in the City's already busy road network. Table 4-2 outlines the actions relevant to the Cambourne to Cambridge Better Bus Journeys Scheme.

Table 4-2 Action Plan (taken from TSCSC Figure G1)

1) A1301/A428 corridor outer P&R Capacity	
Aim	To provide one or more P&R site or rural interchange accessed from the A428, to take advantage of the bus priority measures on the A1303 between the A428 and the M11, to intercept more Cambridge bound traffic on the A428 and increase the mode share using bus as the final mode into Cambridge.
Justification	*"A P&R already exists on Madingley Road, however it doesn't have the capacity needed to accommodate the additional car trips generated along the A428 corridor. Through the provision of segregated facilities along the corridor, P&R buses would benefit from the same advantages in terms of journey time and reliability of other services on the corridor, making it an attractive option for people who would otherwise drive to Madingley P&R or the City Centre. More trips could be intercepted further out, helping free up capacity at existing pinch points."*

The TSCSC suggests that a balance between the number of stops on a bus service and fast access to Cambridge will need to be considered when determining the exact combination and location of the P&R sites and services that are likely to operate from them.

Cambridge City Deal

The Cambridge City Deal highlights M11 Junction 11, Junction 13 and Girton Interchange as having 'severe capacity issues'. Tranche One of the City Deal, from 2015 to 2020, identifies the Cambourne to Cambridge Scheme, among others, as major transport interventions to help alleviate the congestion at these interchanges.

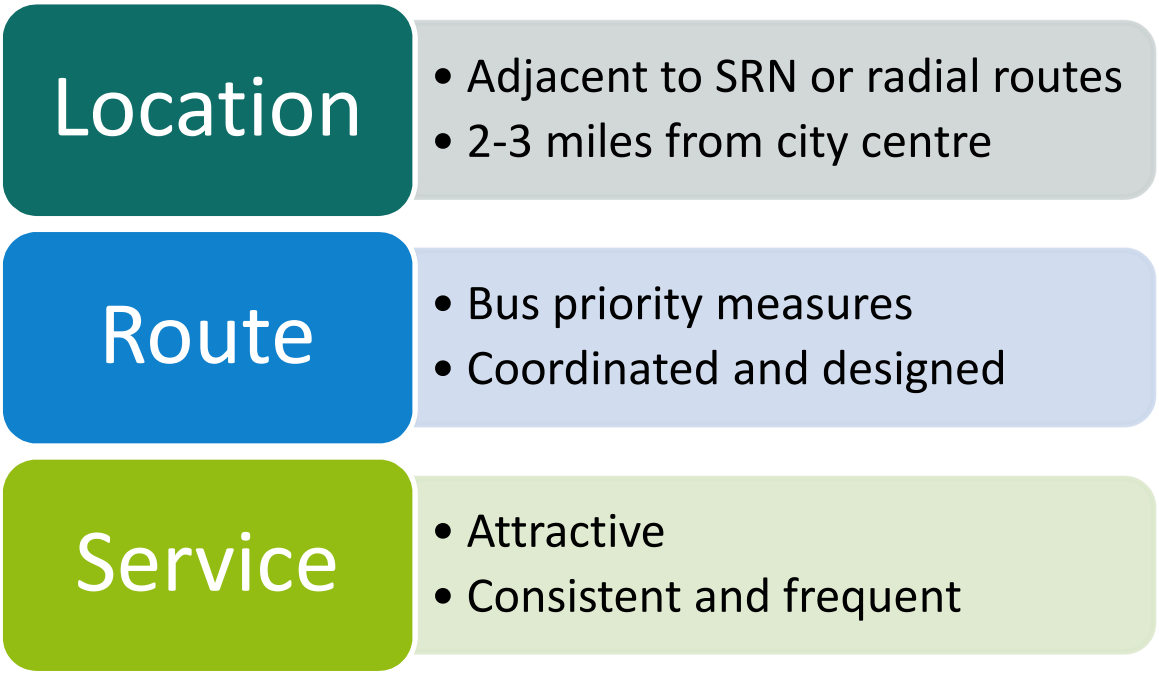
A.1.3. P&R Policy and Guidance

CIHT P&R Guidance Note (18th February 2016)

The CIHT P&R Guidance Note is based on a survey of local authorities operating P&R services and sets out issues to be considered in the development of a successful service. The note suggests the following:

- Sites should ideally be located on or adjacent to the strategic road network or on radial routes;
- A P&R service needs to be attractive in its facilities and costs, providing fast, frequent and reliable inbound and outbound bus services;
- Bus priority measures may also need to be considered to increase reliability;
- The average distance from a City Centre is 2-3 miles;

- Route lengths need to be carefully coordinated and designed, incorporating a limited number of intermediate stops conveniently located at popular locations; and
- The provision of a consistent and frequent bus service needs to be maintained throughout the day.



Cambridge TIF Public Transport Business Case (March, 2008)

The Public Transport Business Case provides context and proposals for public transport within Cambridge to 2021. Considered in the report is the requirements for P&R sites including the expansion of the existing Madingley P&R. The report suggests that Madingley P&R would be required to expand to accommodate 2,750 spaces by 2021 with a link to Huntingdon Road via the North West Cambridge Development.

The report also highlights challenges and opportunities for providing a "*high quality, high frequency and completely reliable network of public transport services*" in Cambridge. Challenges include the quality and capacity of interchange facilities, waiting environments, provision of information and ticketing. Opportunities include the provision of Real Time Passenger Information (RTPI) across the network and integrated ticketing systems. The Public Transport Business Case sets out facilities that should be provided at varying types of Public Transport interchange. The following should be considered for installation at a major transport interchange:

- Bus shelter: enclosed or semi-enclosed;
- Bus stop flag;
- Seating: perch;
- Large central information point;
- Large timetable case;
- Printed top specific service list and timetables;
- Leaflets;
- Audio information point;
- RTPI: central display and stop display;
- Customer service staff on-hand;
- Operational staff on-hand;
- Totem Pole;
- Finger Post;
- Bus Boarder (including raised kerb);
- Bus bay markings;

- Internal lighting for bus shelters;
- CCTV;
- Phone;
- Litter bins; and
- Toilet.

Cambridge Rural P&R Development Plan (Steer Davis Gleave, 2005)

The 2005 Steer Davis Gleave P&R Study concerns the feasibility of the long-distance P&R concept whereby sites are located on an 'outer ring' in order to extend the distances that P&R services operate. The report suggests that in order to achieve reductions in car usage in Cambridge City Centre and to keep traffic levels static on the periphery, long distance P&R options could be essential for people to access employment, education, retail and leisure facilities in the City. The sites would widen the choice along transport corridors and connect rural areas to the urban areas and corridors.

Five corridors were identified as having the potential to accommodate long-distance P&R sites:

- A1307;
- A10 (north);
- A10 (south);
- A428; and
- A14.

Modelling forecasts showed that potential use of the sites appeared low when compared to use usage of existing P&R sites. The Development Plan suggested that this could be due to the following reasons:

- Longer distance P&R sites have the potential to only attract users of one transport corridor whereas closer sites can appeal to more than one e.g. Madingley P&R attracts users of the A428 and M11;
- Longer distance sites are feasible to a smaller proportion of demand e.g. of journeys on the A10 (north) only 52% originate north of Waterbeach; and
- In general people desire to travel by car rather than by public transport, therefore wish to travel by car for a longer distance as possible until otherwise encouraged to switch mode (e.g. by congestion).

Public consultation events were held in St Neots and Haverhill and highlighted a number of key concerns; costs, operating hours, and congestion. Preferred sites were highlighted at Hardwick and Haverhill following demand forecasting. However the study was part of Transport Innovation Funding and was not progressed further at the time.

A.1.4. Policy Summary

The policy review sets a clear context for the provision of new and expanded P&R sites to meet the continued growth in the county, including on the A1303/A428 corridor as an important strategic link into the City. The Steer Davis Gleave 2005 P&R Study goes on to demonstrate that P&R provision on an 'outer ring' is important in keeping traffic levels within the City static and accommodating future growth, however initial demand forecasting showed low use when compared to 'inner ring' sites.

Policy documents also provide guidance on the facilities and infrastructure required at a major transport interchange to ensure that services provided are accessible, reliable, and of a high quality.

A.2. Park and Ride Capacity Analysis

The following data has been recorded for the existing Cambridgeshire Park and Ride sites. Distance from the sites to the city centre have been taken from online mapping measurements. Areas for the P&R sites have been measured from online mapping and provide approximate areas for the hard-paved areas and landscaped areas.

Table A2-1 Existing Park and Ride Information

	Distance from city centre				Areas of site	
Name	**Miles**	**Km**	**Location**	**Spaces**	**Car Park (m²)**	**Total (m²)**
Madingley Road	2.2	3.5	Outskirts	930	35,000	73,043
Newmarket Road	2.9	4.7	Rural	873	38,000	71,855
Trumpington	2.9	4.7	Residential	1340	44,000	77,376
Babraham Road	3.8	6.1	Rural	1458	24,000	85,887
Milton	3.4	5.5	Rural	792	24,805	67,183
Longstanton	6.4	10.3	Rural	350	14,691	67,183
St Ives	11.3	18.2	Rural	1000	15,699	49,829

From the data presented above the following ratios of car parking spaces to hard standing areas and hard standing areas to total site areas.

Table A2-2 Derived Ratios from Existing Park and Ride Information

Name	**Ratio of Hardstanding area to Total Site Area (sqm)**	**Ratio of car parking space to hardstanding area (1 space per Xsqm)**
Madingley Road	0.48	37
Newmarket Road	0.53	43
Trumpington	0.57	32
Babraham Road	0.28	16
Milton	0.37	31
Longstanton	0.22	41
St Ives	0.32	15
Averages	***0.39***	***31***