Stagecoach

BUS SERVICES NEW RESIDENTIAL & DEVELOPMENTS

General Highways and Urban Design advice to applicants and Highways Authorities

STAGECOACH
UK BUS | 2017

PROLOGUE

Buses continue to represent the most popular form of public transport in Britain. Across the UK, over 4.7 billion passenger journeys are made each year. This number continues to grow. Buses offer access to work, leisure, education, and a whole range of other activities. They play a vital role in providing mobility and reducing social exclusion. Most bus journeys also involve walking, cycling, or both: regular bus use sustains a greener and healthier lifestyle.

In parts of the bigger cities of Britain over one in three journeys to work is now made by bus. Nationally, one in three secondary school pupils reaches school by bus.

Much more work needs to be done with partners at a local level to ensure buses can fulfil their full potential, which demands that our services are even more reliable, frequent, affordable and convenient, offering higher standards of comfort on the most environmentally friendly vehicles. Every year, Stagecoach consistently invests about £80m in our bus fleets outside London, with further expenditure in supporting facilities and technology, to meet this end. Buses offer by far the most efficient use of road space, and offer a key tool to reduce traffic growth and highways congestion and to improve air quality.

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The relevance of buses to sustainable development

Over the next 20 years, more new homes are anticipated to be built than in the last 40. In parts of the UK where growth will be focused, many towns will see the most growth they have ever experienced, and several will more than double in size. It is especially important that this growth makes fullest possible use of the opportunities offered by public transport, by "designing in" those features that support the efficient delivery of the highest-quality bus services.

Where buses are properly considered at the outset, in development location, master planning and detailed design, high levels of service take-up are achievable. Indeed, across a very wide variety of scenarios, appropriate development can help catalyse improved bus services that achieve mode shift across a wider area. This can help to offset the residual car-borne traffic from a proposal. Where buses are properly harnessed in support of the best development proposals, they can provide wider public betterment.

Urban design must respond to a number of important considerations. This document is intended to highlight the critical elements that are needed to ensure that buses can best serve developments, and play the fullest possible role in delivering high-quality, attractive and sustainable placemaking.

The role of this document

This advice is focused on the design aspects that have an impact on bus operations, and is intended to supplement and assist in the interpretation of national and local guidance and policy, including Manual for Streets 2. This advice is intended to be broadly relevant, in particular in England and Wales. However in Scotland specific legislative differences may apply.

It is aimed at supporting all stakeholders in the development process from planning and site identification, to construction and handover. This including developers, their client teams, highways and planning authorities.

Stagecoach UK Bus operating companies will always seek to assist as far as they can on a site-specific basis, and we greatly value the earliest possible dialogue with all parties involved, to ensure the best possible solutions are identified and incorporated in proposals.

We recognise that effective partnership endures over the long term. Stagecoach will aim to provide consistent ongoing support through the planning, detailed design, and delivery process; and over the lifetime of the scheme as residents continue to move in and are making travel choices.

Finally, true partnership can never be based merely on a set of "rules". Communication is the most vital component, and this document is intended to open the door to ongoing dialogue. Contact details for each of our local teams are provided at the back of this document.

We look forward to talking to you.

1. HIGHWAYS DESIGN AND SPECIFICATION

High quality bus services require roads that facilitate relatively large vehicles being able to make safe and relatively efficient progress, multiple times per hour, in two directions. Such streets should therefore be designed as Primary Streets, giving a relatively high priority to its "movement" function through its design.

Streets intended primarily to act as "places", rather than as movement corridors, will not typically be appropriate for use by buses.

While buses are often similarly sized to modern refuse collection vehicles, for which layouts are always tracked, they operate in a different manner. Where streets are intended to accommodate a bus service they should therefore be tracked for the appropriate vehicle type to operate in both directions. *(fig.1)*

*Fig.1: **Bristol, Charlton Hayes Primary Street. An ideal route to provide efficient bus access to and through a major urban extension. Bus gates will prevent it being used by through traffic.***

1.1 Essential engineering requirements for roads acting as bus routes

- **A clear carriageway width of at least 6.2m** must be consistently available, with any on-street parking provided off-carriageway in parallel dedicated bays *(fig. 1)*.
  - Ideally bus routes should be designed with a standard minimum clear width of 6.5m.
  - Localised widening should be assumed on bends, in line with results of a realistic tracking exercise.
- Alignment of the street must avoid needless and excessive changes in direction or priority.
  - **Tracking should permit** two buses to pass in opposing directions without the corners of vehicles, or tyres, typically needing to remain less than 200mm from the kerb for extended distances *(fig. 2)*.
  - Tracking should be performed for 12.2m Scania K230UB single deck buses, for which a general arrangement is attached at Appendix A.
  - The front offside corner of the bus should never normally need to perform an excursion over the marked carriageway centreline. This will require localised widening on bends with tight radii. *(figs. 3, 4)*
  - Inside kerb radii of 25m represent a good minimum to avoid tracking problems along mainline carriageways.
- Vertical deflection to achieve traffic calming should be avoided.

We strongly support other approaches, such as the use of changes in pavement colour and texture (including rumble strips, or cobbled margins and overruns to reduce perceived carriageway width) as an alternative to vertical deflection. *figs.6, 7)*

Fig 2: Unnecessary deflection. This road was designed to accommodate buses but this has proved to be impracticall. Just 2 or three cars parked on-street, would make tracking very difficult for buses.

Fig. 3: Tight bends and limited visibility, combined with 6m width and uncontrolled on street parking means this road is not suitable for bus operation.

Fig 4. Peterborough, Cardea. Appropriate road curvature reduces speed without an excessively tortuous alignment.

Fig 5. Basingstoke Taylors Farm: Feature Square accommodates casual parking without affecting the bus route.

Fig. 6: West Malling, Kings Hill - spine road lozenge and overrun feature calms traffic by occasional introduction of a feature obstacle. These should be tracked for 12m buses.

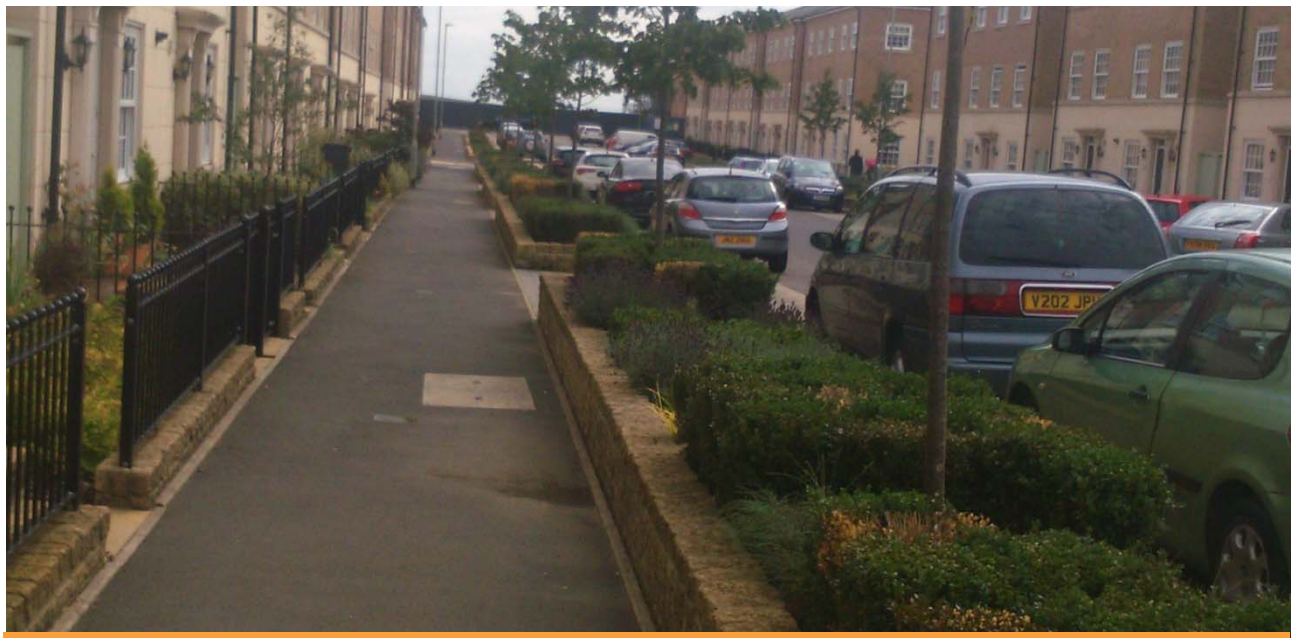


Fig 7: Corby Priors Hall: parallel parking bays are provided continuously off-street. Planters add a further buffer between the main street carriageway and both pedestrians and habitable rooms, in a high-density development featuring continuous frontages.

1.2 Traffic calming on bus routes: alternative design approaches

Stagecoach recognises that in certain circumstances active traffic calming measures may be needed. This is more likely to be the case where straighter streets define development blocks within higher-density schemes of more urban character.

Where specific urban design conditions and opportunities warrant or permit, streets designed for bus operation ***could include:***

- ***Speed cushions*** - These can be much more desirable than tables or ramps. However, a careful approach needs to be taken to their positioning and specification.
  - We support DfT guidance, advising a maximum cushion width of 1600mm.
  - To allow the bus to effectively straddle each feature without sudden steering movements, there should be a minimum 600mm offset between the kerb and the nearside edge of the cushion
  - on-street parking needs to be prohibited, for at least 25m either side of each.
- ***Full-width speed tables*** – These can cause issues if they are too frequently included. Where their use is considered essential, these should be designed to present a ramp height of no more than 75mm, and a transition gradient of no more than 1:15.
  - Detailing of speed tables, especially when applied at junctions, should clearly delineate the vehicular carriageway, typically featuring kerblines with a face of at least 25mm, or contrasting gutter channels.
  - Tracking of buses should ensure that there is no need for any portion of the vehicle to oversail the footway.
- Throttles/narrowings pose no problems if used sparingly.
  - The most appropriate sites are likely to be found where major pedestrian and cycle routes intersect the street.
  - Symmetrical narrowing is preferred over chicanes or offsets *(fig. 6).*
  - We consider 3.8m is the minimum appropriate width for single-track sections, which should be no longer than 6m in length.
  - Clear inter-visibility must be provided for on both approaches to such features, with suitable clear road length and width on both approaches to allow a bus to wait to allow an oncoming vehicle to pass.

Filtered permeability *through use of bus gates,* or offset contra-flow bus lanes, could offer a much better means of achieving traffic calming, and reducing inappropriate through traffic, while not disadvantaging buses (see section 1.5).

Fig. 8: ***Peterborough, Cardea - short single-track throttle at pedestrian crossing. Note the gentle ramp transition and good cross-visibility.***

Fig 9: Bristol Lyde Green Spine Road – approach to surface treatment appears to narrow the carriageway, while allowing for tracking of larger vehicles.

Fig.10: ***Telford Lawley ph 1 - careful use of offsets, changes in width and surface, and controlled on-street parking are used to create visual interest and reduce speeds while avoiding delay to buses.***

1.3 Shared space on proposed bus routes

Thoughtfully-designed shared surfaces, can be incorporated on bus routes, perhaps at a Local Centre or a feature square. However special care is needed to permit safe and efficient bus operation in shared space areas. We strongly recommend that extensive lengths of shared surfaces on proposed bus routes are avoided.

Parking in shared-space areas should be accommodated in marked bays. Means must be found to effectively prevent casual parking.

We recommend shared surfaces should clearly delineate the main vehicular carriageway, to avoid buses straying into areas intended mainly for pedestrians.

The design of any bus stops to be provided within shared space areas is likely to need particular care *(fig 11.)*.

Fig. 11: This pair of stops in a shared space local square presents significant hazards. A stopped bus is likely to block the vehicular carriageway entirely. Note the treatment of boarders and the road surface, which does delineate the vehicular carriageway.

Stagecoach very strongly recommends early consultation with the local operating company as well as the Local Highway Authority, where "woonerf" design approaches to shared space are being considered on a proposed bus route.

Fig. 12: Preston, Cottam Area 1 - Shared space can provide for bus services if well conceived.

CASE STUDY 1

Lyde Green Urban Extension, South Gloucestershire

This planned urban extension lies north East of Bristol beyond the A4174 Avon Ring Road. The urban design takes great care to ensure buses can make unimpeded progress within an extensive development.

The primary street is 7m wide with substantial localised widening on occasional 90-degree bends, which feature relaxed radii allowing buses to navigate smoothly.

There are no vertical traffic calming measures but changes in surface treatment are used, as well as more sophisticated visual cues such as the use of setts rather than white lining to demarcate shadow right turn lanes. Despite continuous block frontage and formal design at three-storeys along much of the route, properties intentionally stand back from the highway.

All dwellings facing the bus route have on-plot parking and many feature double-width drives. Together these features balance urban design requirements with highway safety, without compromising efficiency of the bus circulation.

Fig. 13 Bristol Lyde Green - Park and Ride and local mode change.

1.4 Master Planning for Bus Routes

Buses need to be able to reliably make good progress. In larger urban extensions in particular, where buses are intended to circulate through a development for any distance exceeding 1000m, a 30mph design speed is likely to be required. This is also likely to be necessary on smaller projects where an inter-urban route is required to operate through a development.

It is essential that, as far as possible, diversions of existing bus services into proposed developments should be designed to minimise the amount of extra journey time or mileage involved. Within developments, any proposed bus route should therefore take a suitably direct and intuitively logical route.

Large urban extensions offer both significant opportunities, and particular challenges. A variety of parameters influencing the master plan will have a significant bearing on the efficiency and effectiveness of the bus service/s provided. These include density, land use disposition, design idiom and the location of key nodes and facilities, such as schools.

It is especially important that we are able to engage with development promoters and their client teams early, while design is evolving, and before these matters are "frozen" in the form presented for planning approval. Where relevant, we are always happy to participate in wider discussions with a range of stakeholders, including the local planning and highways authorities.

CASE STUDY 2

Wokingham Southern Distributor Road

This road will act to help relieve a congested town centre, but also is the main vehicular access to a large development area, which ultimately will span both sides of a rail line. The tension between achieving efficient vehicular movement while maintaining a high quality of environment and amenity has meant that the road corridor has been designed holistically, making use of both urban form and planting. A relatively high density of development including apartments and town houses fronts the road to create a clearly urban impression, helping slow traffic.

However, there is no direct frontage access to the road. There are generous verges, and shared-used foot/cycleways, which together with small front gardens provide a buffer to the carriageway. A number of off-street parking bays are included, but the whole street will be designated an urban clearway.

Traffic calming is "designed in" by a large number of passive means, including central shadow islands, pedestrian refuges and central reserves, and changes in pavement surface treatment. Planting is also used as art of the highway design, to achieve multiple objectives, meaning that traffic engineering and the environment need not always conflict.

1.4.1 Access points

Access for buses should ideally be situated at either end of the proposed development area, to minimise the circuity of any diversion into the scheme. Where this is thought to raise the potential for rat-running, or presents other difficulties for the wider highway network, a bus gate or gates might be incorporated to preclude general traffic. The design approach may provide buses with considerable advantage in using a direct route while general traffic must take a longer and less intuitively obvious one (see Section 1.5).

1.4.2 Single Points of access for buses and "spur" working

Where only one point of vehicular access is provided into a development, it is less likely that a bus service will penetrate unless the proposal represents a major bus trip generator. The real and perceived delay introduced onto a service by entering and exiting a development en-route with a route "spur" (also known as a "double run"), is known to seriously reduce the wider attractiveness of the bus service concerned.

The likelihood that a single point of access for buses will prove to be feasible and agreeable, depends strongly on minimising the time taken to enter and leave the site, and serve a stop within it. Ideally this should be no longer than 2 minutes in total. *(fig. 19).*

This will generally involve the primary access being a short length of high-standard highway, with no frontage access or side turnings, linking a roundabout on the existing bus route, to a second sited a short distance into the scheme.

Fig. 19: ***Gloucester Coopers Edge - short double run into office park and superstore.***

1.4.3 Terminal loops

Creating or extending services to operate as very long or complex one-way loops is very undesirable. This is because, for many travellers, such loops involve the bus travelling for some minutes in the opposite direction to their intended destination, unacceptably penalising journey time.

1.5 Bus Gates

National and local policy demands that sustainable modes, including public transport, are prioritised in terms of movement and circulation, where new development is being located and designed.

"Filtered permeability" refers to the principle that selected, more sustainable modes, are offered a more direct route on a key movement corridor, while general traffic has to take a more circuitous one. This is one of the most effective means of prioritising sustainable modes, and bus services in particular.

While pedestrian and cycle-only links can easily be designed to preclude abuse by motorists, for bus-only links, the approach to engineering and enforcement needs more care if the intent is to be achieved.

Bus gates are generally designed to be short single carriageway stretches of road for use by buses only. Cycles can usually be easily accommodated. The guidance on use of carriageway narrowing set out in section 1.2 would also apply. Detailed design guidance should be sought from the applicable Highways Authority, and the likely enforcing authority as required.

Bus gates do present particular challenges for design, maintenance and enforcement. Many arrangements are commonly viewed by adopting parties as being excessively complex, prone to breakdown, or insufficiently effective as a solution.

This is understandable, given past history with mechanical barrier devices in particular. Highway Authorities also have increasing concerns about long-term maintenance liabilities.

Developers and their consultants should therefore always engage at an early stage with the adoption team at the applicable Highways Authority if these features are to be considered. In the experience of Stagecoach, these challenges are usually best resolved through the simplest possible carriageway engineering, with enforcement through CCTV by the appropriate local authority, under measures to decriminalise parking and traffic enforcement. There is now a good deal of experience of this, undertaken by Local Authorities.

The measures should be designed and undertaken in line with the principles and specifications agreed with the DfT's Traffic Penalties Tribunal. These protocols have now been tested at the UK Court of Appeal. This involves bus gates being:

- regulated as short stretches of "Bus Lane"
- appropriately signed and marked in line with DfT Guidance set out in The Traffic Signs and Regulations General Directions 2016
- CCTV enforcement being undertaken under a decriminalised regime by the applicable Local Authority

Where a decriminalised traffic penalty regime cannot be put in place, active CCTV enforcement is impractical.

In such instances, a "tank trap" design can be effective, in line with that developed and approved for adoption by Northamptonshire County Council. This involves the bus straddling a narrow pit, with a raised island at either end, which creates a physical barrier for most cars, and is awkward for motorcycles. This has no moving parts, and involves no electronic controls, while being a suitably robust deterrent for most general traffic. It is accepted that this will not entirely prevent abuse by larger vehicles, including some SUVs. However the great majority of restricted movements will be addressed, whilst also readily permitting emergency access for fire appliances.

Stagecoach ordinarily prefers not to operate through gates enforced by rising bollards, or other physical barrier devices. These require transponders and can be prone to breakdown.

The exception would be exceptionally high-intensity operational situations such as city centres. In city centre contexts every vehicle in the local operating fleet would be transponder-equipped, and breakdown of the barrier is much more likely to be immediately addressed. Elsewhere, such devices risk damaging buses or other vehicles, or preventing buses being able to use a much longer section of road, with no notice, causing delivery of the bus service to fail without warning.

Many Highways Authorities will no longer accept such devices for adoption in any event.

CASE STUDY 3

Kingsway Bus Gates, Gloucester

Kingsway is a 3,300 dwelling urban extension on former MOD land alongside the A38 south of Gloucester, and adjoining the large pre-existing suburb of Lower Tuffley. Passive provision to connect to future development has been made when Lower Tuffley was designed. However, as Kingsway was conceived in the late 1990s, it was clear that general traffic needed to be directed out towards the A38 and the new South West Gloucester Bypass.

However bus services needed to benefit from a more direct routings, which also allowed the combination of existing demand with the new development, to provide the critical mass to support an attractive and high frequency services. Four bus gates have been provided at key access points to the development, and one within it, to this end.

This has permitted a virtual bus priority corridor to be realised from Waterwells Park and Ride, south of Kingsway, through the development to Gloucester City centre bypassing congestion on the parallel A38 route. Another link is provided to local services and employment in Quedgeley; while in the near future, another gate will allow seamless access to the next major urban extension taking place to the south at Hunts Grove.

Fig. 20. Gloucester, Kingsway Bus gate - CCTV enforcement.

CASE STUDY 4

Hampton Hempsted A15 bus advantage, Peterborough

The old arterial A15 London Road bisects a neighbourhood of the major new township at Hampton, known as Hempsted. Through traffic had for some years been intended to use a high-standard replacement route.

The risk that traffic generated by future development elsewhere in the wider Hampton scheme reverted to use the old A15 required that its attractiveness to through traffic was significantly reduced. However, it was essential that the main bus route to Hampton and settlements beyond, could take a direct and efficient route. At the Hempsted Local Centre, general traffic is therefore routed off-line the old A15, around the back of development blocks, while buses continue straight on along a short stretch of bus lane. Signal control activated by on-bus transponders provides further bus advantage.

Fig. 21: Peterborough A15 London Rd - two alternating contra flow bus lanes.

Fig. 23: Pitt Park and Ride: permeable paving and generous planting help integrate the facility into a residential setting..

CASE STUDY 5

Winchester Pitt Park & Ride

Where limited-stop, longer-distance trunk inter-urban services are concerned, creating a hub for local inter-modal interchange is likely to offer an important element of the sustainable travel strategy. Such local interchange hubs should be located to offer immediate convenient access to the service, operating both directions. In this case the site, on Romsey Road, benefits from both frequent passing local services, and a dedicated established Park and Ride service from a pre-existing site further from town. At 200 spaces it is relatively small in scale but since opening in February 2016 it has consistently had very high occupancy.

The design approach allowing successful integration of the facility with surrounding housing is worthy of note.

This successful approach could further evolve to offer high quality waiting facilities. Ideally it would be provided at the focal point of the development as part of a local commercial centre which is likely to incorporate a new adjoining primary school. This strategy facilitates mode change at the same place and time as other local trips.

Fig. 24: ***Peterborough A15 London Road - contraflow bus lane***

2. BUS STOPS AND SUPPORTING INFRASTRUCTURE

The design of streets intended to act as bus routes should incorporate at the outset, high quality bus stop infrastructure at optimised locations consistent with the pedestrian and cycle movement strategy.

Bus stops are an important point of access to information about the services provided. They are essential to signal safe points to board and alight, and need to be appropriately visible both to potential passengers, our own drivers, and other road users. They should also offer fully accessible access to buses for people with disabilities.

2.1 Walking distances to bus stops

The advice set out by the Institute of Highways and Transportation (IHT) in 2000 suggests that 400m is the maximum convenient walking distance to stops in an urban context, and this threshold is generally accepted by most stakeholders, including Stagecoach, as an appropriate guideline to aim to meet.

However, there will be circumstances where, to achieve this standard for all dwellings within a scheme, results in an inefficient and contrived layout, greatly undermining the potential effectiveness of the proposed bus route.

Stagecoach will always prefer an efficient bus routing strategy, serving the great majority of dwellings well, than one that serves all homes poorly with a low-frequency or indirect service. Thus we support policy approaches offering some degree of flexibility on walking distances to bus stops where this is appropriate. However, we strongly recommend that affordable housing, and higher-density development is all located within 400m of a bus stop, and preferably closer.

Where appropriate, focusing on excellent cycle access to bus stops where a significant number of homes lie over 400m from an existing service, may prove more appropriate than trying to achieve a long and circuitous diversion of an existing bus route. This is especially true for longer distance or inter-urban bus routes.

CASE STUDY 6

Elsea Park, Local Bus Interchange Bourne, Lincolnshire

As a relatively small market town, Bourne does not support a town bus network. It does benefit from an established, direct inter-urban bus service to Peterborough, that now runs up to three times per hour.
Elsea Park is a very large strategic site designed to meet housing need across several Local Plan periods. Providing approximately 3000 dwellings it will take over 20 years to build out, commencing in 2002. It will extend over a mile to the west of the main bus corridor, and it would not be practical or appropriate to divert these existing bus services for many years, if ever.

While a bus spine is being provided within the scheme, it was intended that the development should rely on short local journeys being made to the existing bus route. A feature interchange stop was provided in the very first phase on the London Road, with covered waiting and cycle parking, as a separate kiss and change bay for drop off and pick up.

Fig. 25: Bourne Elsea Park feature stop on A15, drop off point and cycle racks.

Fig. 26: Bourne, Elsea Park feature bus stop and local interchange incorporating cycle stands and excellent pedestrian facilties.

2.2 Bus Stop Location

Development proposals should seek, from the very outset, to create effective stop catchments from within surrounding and/or adjoining development. The locations of new or relocated bus stops to serve development, whether on-site or adjacent, therefore need to be broadly identified at the earliest feasible stage, and typically within the Master Plan consented at Outline stage. Subsequent design development at Design Code and Reserved Matters stages can then resolve any potential conflicts with detailed design requirements.

- **Attractive** walking routes can usually be provided to the bus stops, from all points within the development.
- In addition, it may well be appropriate and possible to create similar links from adjoining existing or proposed development. These pedestrian links should be logical and reasonably direct.
- All reasonable and deliverable opportunities to effectively combine potential demands from adjoining pre-existing development, should be identified and secured. With this in mind, the careful consideration of pedestrian permeability across the site boundary during master planning can make a very substantial difference in the quality of bus service that can be provided.

CASE STUDY 7

Great Western Park, Didcot

This 3000 unit scheme west of Didcot sits either side of an existing bus service on Harwell Road, as well as providing a new one along a single spine road running through the centre of the development.

The Master Plan has paid careful attention to the location of bus stops as part of an overarching strategy that integrates walking and cycling routes. Clearly legible and direct pedestrian routes, that are mainly traffic-free, lead directly to stops, both on the existing Harwell Road, and the spine road, giving convenient access to bus services to a full range of destinations.

Figs. 27-28: Didcot Great Western Park - very direct and well-surveilled pedestrian corridor leads directly to bus stops.

2.3 Bus stop siting and spacing

Bus stops provided within developments should be:

- **lit and appropriately overlooked**, and suitably prominent within the street scene, without being intrusive.
- provided in normal circumstances **between 280-320m apart**, to maximise the number of dwellings within easy walking distance of stops, while avoiding stops being so close together that buses cannot make efficient progress.
- However, where bus routes cross large undeveloped areas, then bus stops are not likely to be needed on those stretches.
- sited downstream of side road junctions to avoid blocking sight lines.
- **located to** effectively serve the widest possible hinterland.
- In most cases this will be at significant nodes of pedestrian movement, such as near major intersections, within urban squares, or where strategic green space corridors intersect the bus route.

Stagecoach recognises that bus stops present real and perceived amenity issues where they are positioned directly adjacent to dwellings, on active frontages. Obviously, this needs to be avoided wherever possible *(figs 27, 28).*

Where stops must be sited on active frontages, amenity conflicts can be greatly reduced by positioning stops where:

- longer garden walls flank the footway
- garage blocks/flats over garages back onto the footway
- the building line of plots adjoining the stop can be be significantly "stepped back" from the back edge of the footway
- there is a small area of open space. It is undesirable for stops to be sited immediately next to equipped play areas.
- shared private drives can offer an additional buffer between the street and dwelling frontages.

Agreement of optimal bus stop locations, before reserved matters applications are prepared, is essential if such conflicts are to be "designed out" as far as possible.

2.4 Bus stop positioning within the adoptable highway

Most bus stops within urban contexts will be provided "on-line", on the running carriageway. Lay-bys at bus stops within built-up areas are generally not necessary or appropriate, unless specific circumstances apply. We offer specific guidance later in this section.

The location and design of bus stops should ensure that buses can safely and smoothly draw in to stop alongside the kerbline where the designated boarding area is positioned.

- Pulling into the stop, and pulling out, should never normally require the bus to cross over into the opposing carriageway; or need any part of the bus to oversail the kerbline or edge of the carriageway.
- Tight curves are places where bus stops are impractical, as a general rule.
- Bus stop clearway markings should be provided of 25m length, and/or a combination of cage markings and no parking/waiting restrictions should be applied to allow buses to approach and pull into the stop without being blocked by parked cars. *(figs 29, 30.)*

Fig 29: Illegal and inconsiderate parking makes it impossible for bus stops to be used safely. Parking bays or a stop buildout would have been appropriate in this street

Fig. 30: The results of inconsiderate parking at a bus stop. All road users are adversely affected, not just bus passengers.

Where new stops are being provided on existing highway, a sufficient pavement width should be available, or provided, to allow passengers to wait without obstructing other pedestrians, including those with pushchairs or wheelchairs.

- A pavement width of least 1.8m is realistically needed to allow for a bus stop.
- Ideally a greater width would be provided, to allow for provision of a flag and other infrastructure including a shelter, without narrowing the usable footway width to less than 1.5m.

Bus stops should never be sited so near pedestrian refuges or median islands, that the carriageway can be blocked by a stationary bus, or where there is any temptation for motorists to pass a refuge, central island or bollard by using the opposing carriageway.

2.4.1 Bus stop boarders

Bus passengers should always board or alight directly onto a paved footway surface of suitable width.

Where there is no footway provided adjoining the kerbline on the relevant side of the bus route, a dedicated hardened boarding area of no less than 3m in length and 2m in width is generally needed, to provide sufficient safe waiting space to meet Equality Act standards. This should be tied in to the required length of new footway to a pedestrian crossing with dropped kerbs, and where necessary, a pedestrian refuge, ideally provided "upstream" of the stop. Further advice should be sought from the Local Highways Authority.

Particular care need to be taken when positioning stops and shelters on streets where an off-road cycleway is provided, whether dedicated, or shared with pedestrians.

- Under no circumstances should cycleways run along the kerbline at bus stops such that disembarking passengers alight onto a cycleway of any kind.
- Shelters should generally be positioned on the kerbline with any cycle provision behind. This allows continuous cycleways to be maintained.
  - However local circumstances and constraints are likely to mean a variety of approaches are appropriate.

Bus stop boarders should be paved at least to binder course, and flags should be erected at the earliest reasonable opportunity, and as far as possible before adjacent properties are occupied, even if the service is not due to be provided for some time thereafter *(fig. 31).*

We would expect that raised boarders should be provided in most instances, complying with the specifications provided by the Local Highways Authority.

Where this is unavailable or unclear, Stagecoach recommends precast concrete raised kerb units supplied in sets, incorporating transition kerbs and integral anti-slip top faces, and with a raised boarder face with integral batter of 160mm above the carriageway.

Fig. 31: Andover, ***East Anton MDA- preferred raised boarder detail.***

The faces of precast boarder kerbs should be smooth and not textured, and incorporate an integral batter, to avoid tyre scrub and damage. "Kassel" kerbs incorporating 180-200mm faces, and gutter "nibs" are nevertheless acceptable.

2.4.2 Bus stop build-outs

It is generally very important that a bus can stop on the carriageway, without having to negotiate parked cars to pull in. Therefore Stagecoach welcomes, and strongly recommends, incorporation of on-street parking in off-carriageway bays. This does require the kerb-line to be built out between parking bays, at bus stops.

- A minimum 4m boarder length is required, inclusive of transition kerbs, while 6m is strongly recommended.
- Build-outs should extend the full width of parking bays, generally 2m-2.5m wide,
- Build-outs should generally not project beyond the gully line into the carriageway.
- Shelters, where provided, should generally be located within the build-out to allow buses and waiting passengers to be inter-visible. This will also reduce conflict with building frontages.

2.4.3 Bus lay-bys

Bays or lay-bys are not generally appropriate within new residential developments. However, they are required where it is anticipated that the stops might involve a bus being stationary for significant lengths of time.

This could be when the stop is:

- intended to act as the terminus for a service or services;
- anticipated to serve large numbers of passengers boarding or alighting on certain journeys (such as a secondary school or major district centre, or within retail or leisure developments).

Partial pull-ins (between 1.7m and 2m wide) with appropriate lead-in and exit tapers, might be appropriate to allow traffic to safely pass within or adjoining residential developments, while also allowing buses to easily pull away from the stop *(fig. 32)*

*Fig. 32: **Amesbury Archers Gate, Stockport Way - partial pull-in and bus stop.***

Where lay-bys and pull-ins are provided, generally on rather busier streets of roads, advice should in the first instance be sought from the relevant Highways Authority.

- bus stands and lay-bys should be tracked for 12.2m Scania K230UB buses, in line with the guidance above.
- It is especially important that tapers of sufficient length are provided on the approach to and departure from the stop, to avoid the need to perform sharp turns into and out of the stops.

2.5 Street Furniture at bus stops

All street furniture at bus stops should be set back from the kerb face by at least 600mm to avoid them being hit by the rear-view mirrors in particular, and to assist in preventing passengers standing too close to the kerb.

Fig. 33: Didcot Great Western Park - Recommended basic standard for bus stop infrastructure.

Bus stops should be provided with, as a minimum, a flag incorporating an integral timetable case, to the standards set by the adopting authority, and in line with their guidelines for premium/core bus services. A consistent specification of bus stop flags and timetable cases along the whole route is desirable.

Shelters are very desirable depending on the context. Separate advice on a site-by-site basis should be sought from the Highways Authority, and it is often worth additionally consulting with the Council likely to adopt the shelters in due course. There is a trend towards private maintenance on many larger developments. In other cases, most shelters within a local authority are provided and maintained by commercial advertising companies. The local Stagecoach operating division may also be able to assist in identifying the likely maintaining party.

Litter bins can also help manage the street scene at bus stops. The advice of the planning authority should be sought.

Fig. 34: Crawley Kilnwood Vale - top quality infrastructure and bus service in place on phase 1, and highly visible at the point purchasers are making their buying decision.

3. PARKING PROVISION ON BUS ROUTES

The treatment of parking on bus routes has a major bearing on the ability of buses to serve the site effectively, whatever the context and urban design approach. The impact of unplanned informal, incidental and inappropriate car parking on streets intended for use by buses is probably the biggest single difficulty faced by Stagecoach and other bus operators serving recently-built developments.

On-street parking has a severe potential impact on bus operations, particularly where for other reasons, highway alignment and width is reduced to minimum standards.

There are now multiple cases of developments where on-street parking has in practice precluded bus services from operating into them as intended.

Even where buses can proceed, vehicle operating speeds can become so low that sustaining bus operations becomes very difficult.

It is clear that accommodating parking on bus routes demands an especially careful and well-informed design approach at all stages. We broadly welcome and endorse the detailed and considered guidance set out in the English Partnerships/HCA Guide: "Car Parking: what works where" (2006). Most of the "golden rules" on page 18 of that document remain appropriate and relevant. However this is general guidance and makes no specific reference to how such strategies might affect bus operation, positively or negatively.

3.1. Parking Standards

Stagecoach strongly supports approaches that allow for adequate parking to be provided throughout residential developments. In line with the HCA guidance, wherever possible that parking should be provided within the dwelling curtilage, and/or under its direct surveillance.

3.2. On-street Parking

On primary streets intended to be used by buses, the use of on-street parking to help control traffic speeds needs to be formally "designed in", and intentionally limited to particular marked bays. The use of defined on-street parking bays can achieve the intended purpose of speed reduction, while strictly controlling any wider proliferation of informal on-street parking.

3.3. Good practice for accommodating parking on bus routes

Successful design approaches to parking serving dwellings along proposed bus routes generally:

- provides sufficient parking to accommodate likely residents' demands, off the carriageway
- limits or otherwise carefully considers the number of private vehicular accesses onto the street
- ensures that residents parking is immediately accessible to the plot
- provision is well within the surveillance of adjoining properties
- is easily accessed from the street
- where two spaces are provided on a drive, allows more than one car to be parked and used independently *(figs. 36 and 37)*
- does not rely on garages being used as parking space for cars
- intentionally avoids lengths of "free" kerb-line directly backed by footway
- treats parking as an integral part of the street scene
- "Designs out" opportunities for inappropriate parking
- ensures that under normal circumstances, vehicles enter the mainline carriageway in forward gear
- provides parking spaces between the building frontage and the carriageway edge by whatever means is most appropriate.

Fig. 35. Peterborough Hampton Hargate: shared private drives add an additional buffer between the dwelling and street, and reduce the need and attractiveness of the street to park.

Fig 36. Bristol Lyde Green: Generously sized drives allow two cars to be parked off-street in a relatively high density development.

Fig. 37. Preston Northern Distributor Road: appropriate provision of off-street parking in a more traditional suburban development at lower densities, will allow buses to make good progress.

Formal parallel parking bays sited between the footway and the carriageway are by far the best solution to ensuring that parking is appropriately managed on bus routes, especially in higher-density contexts where continuous built frontage is desirable *(fig 38).*

Fig. 38: Basingstoke Taylors Farm: on-street parking need not detract from the street scene. Generous planting can also be incorporated.

In lower density developments, use of generous height : width ratios across the principal roads allows for a variety of strategies to be employed. These include shared driveways with grouped crossovers, double-width driveways and service roads/parallel shared surface access ways. *(fig 39)*

Fig.39 : Wokingham Northern Extension. This primary street achieves an excellent balance between multiple urban design requirements. Parking in front of plots, and lavish planting, can co-exist while keeping a carriageway largely free of parking..

3.4. Parking on bus routes: things to avoid

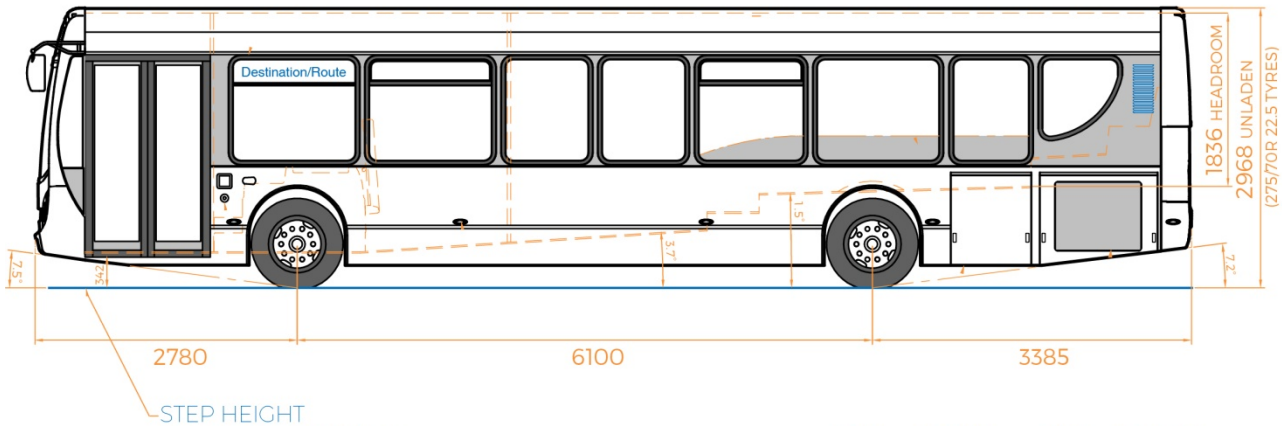
Problematic parking strategies will typically involve:

- the use of restrictive maximum parking ratios in residential areas, contrary to current national guidance
- proliferation of single width driveways, between individual dwellings, with individual crossovers
- long stretches of grass or planted verge margins between the carriageway and the footway, which encourage abuse.
- wider carriageways than typical, but with insufficient parking provision on-plot, leading to parking on both sides of the street *(fig 40)*.
- excessive reliance on parking courts set behind built frontages, especially large ones where parking is not directly related to, or adjacent to, the applicable plot.

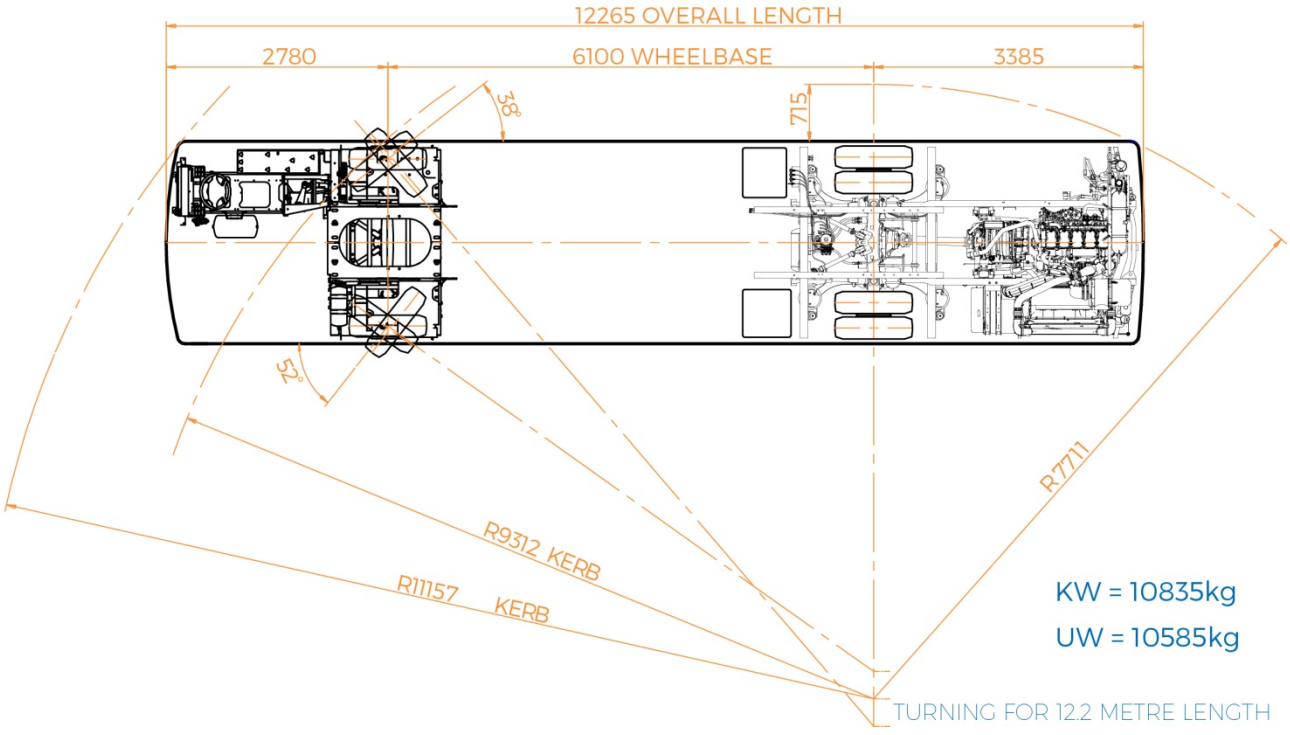
Fig. 40: *This length of primary street, and two stretches either side out of view, are reduced to single carriageway for over 500m. Note too, inappropriate parking on the verge, and on the circulatory carriageway of a roundabout.*

4. BUS GENERAL ARRANGEMENTS

ENVIRO 300 12.2M body on a SCANIA 'KUB' CHASSIS



KW = 10835kg UW = 10585kg



5. INVOLVING STAGECOACH IN THE PLANNING PROCESS

The following basic guidelines cannot fully cover the extremely wide range of locally-specific circumstances that will impinge on a given development proposal. Public transport strategies that are likely to require alteration to, or new bus services, should be discussed at the earliest possible opportunity with the local Stagecoach operating company, to ensure that the opportunities and constraints are identified and fully reflected in the proposals.

Our operating model, allows us to offer developers and promoters a flexible approach in support of planning applications, where we can consider the inherent commercial risks involved in delivering the bus service as the development commences and builds out. Local operating companies can quickly mobilise the assets needed to support public transport improvements to new developments in a very wide range of locations and contexts.

5.1 Development Plan preparation

The best possible opportunities for sustainable development are in most cases likely to be realised through the Plan-led system. Stagecoach operating companies do engage with the planning process, in support of the goals of sustainable development and to highlight the opportunities where the fullest possible use can be made of existing or potential high quality bus services.

Stagecoach is keen to bring its local knowledge and expertise to bear in assisting both Local Planning Authorities and Local Transport Authorities engaged in preparing planning and supporting transport policy; and development promoters seeking to bring development opportunities forward through an emerging Local Plan.

We are looking to further develop our local relationships with Local Planning Authorities in particular, and depending on the nature of the context, we can be involved both informally and more formally, through the statutory consultation process, and the preparation of public representations.

5.2 Site identification

Stagecoach is happy to engage with promoters and local authorities at the earliest stage, on a strictly confidential basis, at the time sites are being evaluated for suitability, whether as part of the Strategic Housing and Employment Land Availability Assessment process, or on a site-by-site basis.

Many otherwise-unconstrained potential development sites, do not benefit from convenient access to any bus service which would offer a credible mode choice. Such sites are also often particularly hard to serve with a relevant public transport offer that could be sustained on a commercial basis in the long term. Stagecoach can advise which existing bus routes are already commercial, and also where it sees future potential to develop or strengthen the commercial bus network.

5.3 Pre-application: scheme design and feasibility

Stagecoach is happy to engage with developers client teams from the outset, again on a strictly confidential basis. Our input is likely to be most relevant where larger proposals are being brought forward, or where a promotion forms part of a wider area identified for development on a strategic scale.

We are able to offer commercially-focused specialist advice, where necessary bringing in our own expert resources across the wider UK Bus business, to support development scoping, master planning, and movement and access strategies. We can help ensure that on-site engineering costs are contained, and that robust public transport strategies and assumptions can be incorporated in Transport Assessments supporting an application.

We would be keen to explore opportunities for development to help deliver wider measures to assist in making bus services more attractive and relevant to a wider audience, such as new Park and Ride sites, or local multi-modal hubs.

5.4 Public Transport Obligations: Section 106 Drafting

Stagecoach has an industry-leading track record in developing strong new commercial public transport operations. We are exceptionally well-positioned in many parts of the UK to ensure new developments are served as well as possible by bus. Generally this will arise for our strong local network in the near vicinity.

Where this is the case, we can leverage network-level synergies to allow developments to benefit from, or catalyse, bus service improvements. We strongly recommend our early involvement in discussions with developers, Planning and Highway Authorities regarding public transport strategies in support of a proposal, and the associated planning obligations required to deliver these.

We can save all parties both time and money through:

- early identification of network development synergies
- advice on the highest possible level of service likely to be commercially sustainable at development completion, and appropriately ambitious targets for bus mode share and mode shift.
- prudent and rational phasing of developments, including triggers for bus service diversions or frequency improvements, not least to assist in ensuring compliance with the Community infrastructure Levy (CIL) Regulations 2010
- appropriate delivery and procurement models, having regard to all relevant legislation
- Providing suitable drafting of language to incorporate within deeds made under Section 106 of the Town and Country Planning Act 1990 (and its equivalent in Scotland). This can also include mechanisms for direct procurement of the public transport package by the developer with Stagecoach, achieving transparent best value.

5.5 Reserved matters and Implementation

Resolution of detailed matters is material to the success of a development "as built". For this reason Stagecoach strongly recommends that operating companies are consulted by all stakeholders in the development process, once an Outline Consent is issued and matters reserved by Planning Condition are being considered.

In particular, on larger schemes, we recommend that we are consulted by stakeholders on the preparation of:

- submissions under s278 of the Highways Act 1980, where appropriate, to ensure existing and new bus stops are accommodated appropriately
- Design Codes steering overall detailed design principles, and establishing in more detail how the design approach set in the approved Indicative Master Plan will be key places will be interpreted and carried forward
- designs for primary infrastructure, which we very strongly recommend should incorporate the provision for on-site bus stops intended to serve the development
- reserved matters layouts, especially where the development forms part of a committed or likely larger area of development, or where a relatively large scheme depends on existing bus services provided on adjacent or nearby roads, but cannot be directly served.

Stagecoach can also assist in the preparation and implementation of effective Travel Plans. Our ability to add value in this area is greatly strengthened by our national strategic partnership with Liftshare.com. We can discuss a range of highly effective approaches to inform and incentivise new residents using the bus. These efforts can be further established by consulting us as site sales material is being prepared, to add detail as to what local bus services are available at the site and close nearby, and ensure that sales particulars are compliant with the Consumer Protection Regulations 2015, in particular in regard to proposed bus services and bus stops.

Once sales have begun on site, our local teams can supply development outlets with a range of timetables and fares information, and supporting incentives as required.

6. STAGECOACH UK BUS OPERATING AREAS & CENTRES

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