

Turning and swept paths

Designers will need to ensure that vehicles can enter and exit new developments satisfactorily without overrunning non-carriageway areas. Overrunning can create damage and trip hazards, and intimidate vulnerable road users.

The following outlines what a designer should consider:

Swept paths

The size of the vehicles to be tracked will depend on the type and character of the street(s) being designed. For the different street types, refer to the *Street Design Matrix*. Whilst a pantechnicon may be the largest commercial vehicle to use a residential street, its use will be infrequent. Quieter residential streets should generally be designed to accommodate a 11.4m refuse vehicle. More heavily trafficked streets would be expected to track for a pantechnicon (removal vehicle).

Swept path software does not include provision for wing mirrors as default.

Swept path envelopes will be required to include for wing mirrors to ensure vehicles have adequate space to undertake movements without putting pedestrians in danger, damaging highway infrastructure, or coming into conflict with other vehicles.

For most residential developments we will therefore require swept paths of road layouts showing the following vehicles passing each other (apart from at localised narrowings):

- 11.4m refuse vehicle passing a large car
- Two 3.5T panel vans passing each other

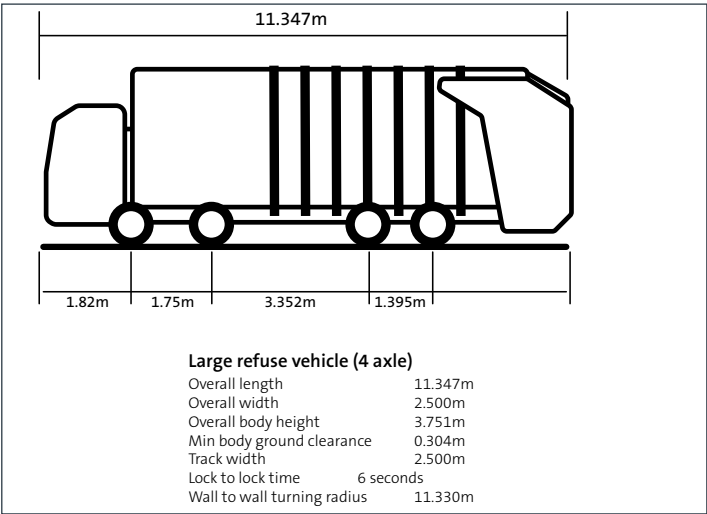
Overrun areas are not considered suitable for the highway, as these can cause confusion over road user priority.

Design vehicles

Designers will be required to submit swept paths for vehicles most likely to use the site, which will normally be a 11.4m refuse vehicle and emergency vehicles. As each different type of vehicle has a different turning requirement, designers will need to consider and address the number and type of service vehicles that may regularly use the road early on in the design process.

Where designing for cars only, a swept path for a large car will be required.

Fig 1: Example 11.4m refuse vehicle



Swept paths will be required to show that vehicles can adequately enter and exit a junction without entering the opposite side of the carriageway, unless the road is very lightly trafficked.

Where streets are likely to experience bus and coach movements, a 15m coach should also be tracked.

Junction radii

Radii of the junctions should be minimised to allow for easier crossing facilities and lower turning speeds. Larger radii will be required where there are significant numbers of larger vehicles turning. For further information on junction design see *3.2.3 Junction Spacing and Treatment*.

Turning heads

Inadequate turning space creates excessive manoeuvring on the highway. Turning heads will be required on roads where vehicles would otherwise have to reverse further than 12m.

Roads within new developments should be designed to be well connected thereby minimising the need for either cul-de-sacs and turning heads.

However, it is acknowledged that cul-de-sacs may be necessary for awkward sites due to topography, boundary or other constraints and in these situations turning heads are essential to allow vehicles to manoeuvre.

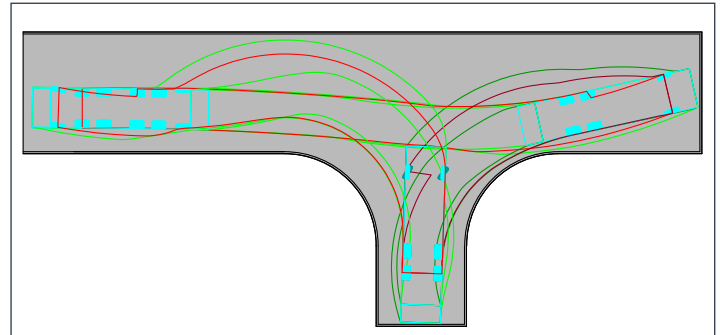
Where a road is to be put forward for adoption, we will seek adoption of the entire turning head as it will serve a public function.

Designers should ensure sufficient on-street parking is designed into the street geometry, or consider the prevention of on-street parking in the vicinity of the turning head which would otherwise impact on its effective operation.

Designers will be expected to provide a swept path analysis to confirm the largest vehicle expected to use it on a regular basis can make a three point turn manoeuvre.

Within a commercial development larger turning heads will be required. Swept path analysis will be required to demonstrate that all HGVs and delivery vehicles can be accommodated.

Fig 2: Typical swept path within a turning head



Any private accesses which need to accommodate service vehicles will need to provide both a suitable access width to accommodate the largest vehicle that will visit the site, and associated manoeuvring space within the site. A swept path analysis will be required to demonstrate this can be achieved whilst taking into account any need to pass other vehicles both along the access and at the nearest junction. This is to remove the need to reverse onto surrounding streets, which is considered unsafe.

Within perpendicular parking areas 6m is required behind a parking space to ensure it is clear to allow for turning. If at the end of a perpendicular parking area, a minimum of 1m clearance will also be required parallel to the space, to enable a car to manoeuvre out of a space without brushing against any structures or areas of planting. For further information on car parking see *Street Design Matrix, 3.1.1 Off-street parking and drives* and *3.5.3 Car parking*.

Fig 3: Car parking layout and turning movements

