Ref: 0113r05v03

28/05/2021

Emag Apartments Pty Ltd
c/-
Weir Phillips Heritage & Planning
Level 19, 100 William Street
Sydney NSW 2011

Attention: Philip North

RE: 2-18 STATION STREET, MARRICKVILLE (DA / 2020 / 0578)
LETTER OF RESPONSE TO COUNCIL

Dear Philip,

We refer to recent correspondence concerning the abovementioned development and in particular, the subject Development Application, DA / 2020 / 0578, which is currently under assessment by Inner West Council (Council) and is due to be considered by the Sydney Eastern City Planning Panel 10/06/2021.

## 1.0 BACKGROUND INFORMATION

PDC Consultants has previously prepared a Traffic Impact Assessment (TIA) (ref: 0113r03v02) dated 15/06/2020 and an Updated TIA (ref: 0113r04v02) dated 12/01/2021. Council has since issued a Development Assessment Report (Report) which recommends refusal for the proposed DA and a number of concerns regarding the development, including traffic and parking.

In this regard, we confirm that we have taken Council's comments into consideration, and now provide the below response. For clarity, we have reproduced the relevant comments from Council's Report below which are highlighted. All other traffic and parking comments included in Council's Report are recurring or have already been addressed in a previous section of the below letter. Our response is provided underneath each of Council's comments.

## 2.0 CAR PARKING

*5. ASSESSMENT*
*5(d) DEVELOPMENT CONTROL PLANS*

*The application has been assessed and the following provides a summary of the relevant provisions of Marrickville Development Control Plan 2011.*

*The following provides discussion of the relevant issues:*

***Part 2.10 – Parking***

*The proposed development does not provide the number of parking spaces that are required by the numeric controls within Control C1 of Part 2.10.5 of Marrickville DCP 2011. Council's development engineers advise:*

*"The application does not comply with the car parking provision as required by Control C1 of Part 2.10.5 of Marrickville DCP 2011. The application is for 120 boarding houses (Including 2 Manager's rooms). Based on Table 1 of Part 2.5- Parking Management of DCP 2011 the provision of parking must be at a rate of 0.5 spaces per boarding room plus 1 space per resident employee. Based on these rates 62 car spaces are required (60+2). Additionally, 3 spaces will be required for the retail space of 266sqm. Therefore, a total of 65 carspaces a required and only 46 have been provided leaving a shortfall of 23 spaces (shortfall of over 29%). Such a large shortfall is not acceptable."*

Council's parking analysis above is outdated and therefore incorrect. An updated parking assessment has been undertaken as per **Table 1** below, which shows the car parking requirement for the proposed development based on the applicable car parking rates under the State Environmental Planning Policy for Affordable Rental Housing 2009 (SEPP ARH 2009) and Marrickville Development Control Plan 2011 (MDCP 2011).

## 2.1 Commercial

The car parking requirement for the commercial component of the development has been assessed in accordance with the MDCP 2011. **Table 1** below shows the minimum car parking requirement under the applicable 'business premises; retail premises; shops' car parking rate, and the proposed provision in response.

**Table 1: Commercial Car Parking Requirement & Provision**

| TYPE | GFA. | DCP PARKING RATE | DCP REQUIREMENT | PARKING PROVISION |
|---|---|---|---|---|
| Commercial | 259m² | 1.0 space / 100m² GFA | 3 | 3 |
| | | ***TOTAL*** | ***3*** | ***3*** |

It is evident from **Table 1** that the commercial component of the development requires a minimum of three (3) car parking spaces under application of the MDCP 2011. In response, three (3) car spaces are provided for the commercial component of the development which complies with the MDCP 2011 and is considered an acceptable level of provision. The allocated commercial car parking spaces are provided on Basement 1 of the development, as illustrated by the Architectural plans included in **Attachment 1** for reference.

## 2.2 Boarding House

The car parking requirement for the boarding house component of the development has been assessed in accordance with the SEPP ARH 2009 and MDCP 2011. **Table 2** below shows the minimum car parking requirement for the boarding house component of the development based on the applicable car parking rates under both the SEPP ARH 2009 and MDCP 2011.

**Table 2: Boarding House Car Parking Requirement & Provision**

| TYPE | NO. | SEPP PARKING RATE | DCP PARKING RATE | SEPP REQUIREMENT | DCP REQUIREMENT | PARKING PROVISION |
|---|---|---|---|---|---|---|
| Resident | 118 | 0.5 spaces / room | 0.5 spaces / room | 59 | 59 | 42 |
| Manager | 2 | Max. 1.0 space / manager | 1.0 space / manager | 0 | 2 | |
| | | | ***TOTAL*** | ***59*** | ***61*** | ***42*** |

It is evident from **Table 2** that the MDCP 2011 requires the development to provide a total of 61 car parking spaces, whilst the SEPP ARH 2009 requires the development to provide 59 car parking spaces, for the proposed boarding rooms. As per Clause 29(2)(e) of the SEPP ARH 2009, the consent authority is unable to refuse consent to the development on the grounds of car parking if compliance with the SEPP ARH 2009 parking requirement is met. In this regard, it is considered that the minimum requirement for the boarding house component of the development is 59 car parking spaces (not 61 spaces).

In response, the development provides a total of 42 car parking spaces for the boarding house component, resulting in a theoretical shortfall of 17 car parking spaces under the SEPP ARH 2009. Whilst this level of provision does not strictly meet the numeric requirements of the SEPP ARH 2009, it is considered that the provision is acceptable and adequate to accommodate the parking demands of the development in the circumstances for the following reasons:

2.2.1 Environmental Planning and Assessment Act 1979 (EPA 1979)

Clause 4.15 (3A)(b) of the EPA 1979 stipulates the following:

> *(3A)* ***Development control plans*** *If a development control plan contains provisions that relate to the development that is the subject of a development application, the consent authority—*
>
> > *(b) if those provisions set standards with respect to an aspect of the development and the development application does not comply with those standards—is to be flexible in applying those provisions and allow reasonable alternative solutions that achieve the objects of those standards for dealing with that aspect of the development.*

In summary, Clause 4.15 (3A)(b) specifies that the consent authority, in this instance Inner West Council, is to be flexible when applying DCP provisions and allow reasonable alternative solutions that achieve the objectives of the standards. It is therefore evident that Council is not to adhere to strict application to the MDCP 2011 but rather allow flexibility given the proposed development's specific characteristics.

2.2.2 MDCP 2011 Advocacy of Limiting Private Vehicle Use

The MDCP 2011 frequently and firmly espouses and promotes sustainable transport and a reduced reliance upon private vehicles across the LGA. This is evident by the very first statements in Section 2.10.4 'Provision rates approach' of MDCP 2011, which state:

> *The main elements of the approach to parking provision rates in this DCP are:*
>
> 1. *Car parking provision is slightly constrained across the entire LGA as a demand management measure; and*
> 2. *Car parking provision rates are further constrained in accessible areas.*
>
> *The approach adopted by the DCP is supported by other private and public domain parking management policies and actions that collectively aim to improve the management of parking and promote sustainable transport across the LGA.*

It is therefore evident that Council advocates reducing car parking on site within accessible areas to promote sustainable transport across the LGA.

Section 2.10.4 of the MDCP 2011 goes on to provide nine (9) examples of features of a DA that would aid in justifying reduced car parking rates that those stated in MDCP 2011. From the nine (9) examples given, the proposed development satisfies at least four (4):

*Justification for providing car parking at a rate lower than that specified in this section of the DCP could include:*

3. *Located adjacent to high-frequency public transport services and/or urban services;*
4. *Includes management regimes to minimise car use, such as workplace travel plans or on-site carshare schemes;*
6. *Development targeted to demographic sector with low car use/ownership;*
9. *Parking for the development is consistent with the aims and objectives of this section of MDCP 2011.*

In listing such justification within its DCP for providing car parking at a lower rate than that specified, Council is acknowledging rigid adherence to the parking rates is not mandatory, supporting Clause 4.15(3A)(b) of the EPA 1979 (Section 2.2.1 above) which recommends applying flexibility.

The proposed development satisfies the above four (4) items from the MDCP 2011, which are discussed in further detail below:

*3. Public Transport*

- As discussed in the previously prepared TIA (ref: 0113r03v02) and illustrated by **Figure 1**, the site benefits from excellent access to public transport services being located immediately adjacent to Marrickville Railway Station and within 400 metres of bus stops located along Illawarra Road. It is therefore expected that the site will operate with reduced car ownership rates and hence, reduced car parking demands.

- As also discussed in the previously prepared TIA (ref: 0113r03v02), under the Sydney Metro City & Southwest project, the T3 Bankstown Railway Line and Marrickville Railway Station will be upgraded to Metro standards. The proposed upgrade is set to open in 2024. As stated on TfNSW Sydney Metro website, the Sydney Metro City & Southwest network and new Marrickville Metro Station will provide substantial improvements on travel times between Marrickville, Sydney CBD and North Sydney. **Table 3** identifies the proposed average service headways during the peak and off-peak periods.

**Table 3: Proposed Metro Service**

| METRO LINE | PEAK PERIOD | OFF PEAK PERIOD |
|---|---|---|
| City & Southwest | Every 4 minutes<br>15 trains / hour | Every 10 minutes<br>6 trains / hour |

The upgrade of the T3 Bankstown Railway Line will therefore result in more reliable, high-frequency, urban public transport services for residents and visitors of the proposed development.

- The resident parking rate specified under Clause 29(2)(e)(iia) of the SEPP ARH 2009 is a generic rate that is required to be adopted for all boarding house developments proposed throughout NSW, and does not include any discounts for sites that are well served by public transport services and / or are expected to generate reduced parking demands such as the proposed development.

- ABS data ('6. Demographic Sector of the Proposed Development', below) has identified significant lower car ownership and higher sustainable transport use for the Marrickville locality in comparison with the NSW average, and therefore the SEPP parking rate is not representative of demographics for the proposed site.

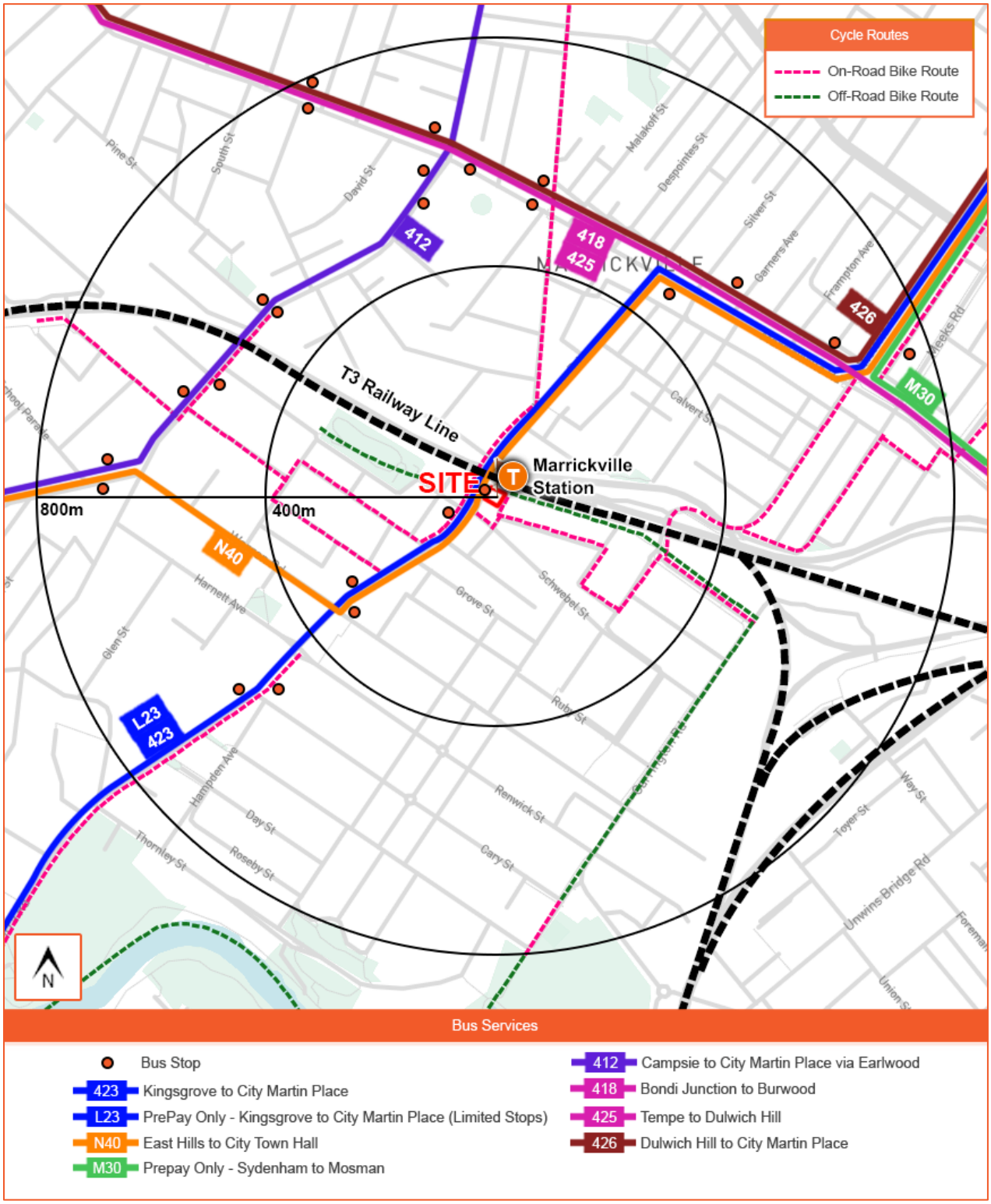



Figure 1: Public and Active Transport Services

## *4. Management Regimes to Minimise Car Use*

*Green Travel Plan*

- As is discussed in further detail in Section 5 of the previously prepared TIA (ref: 0113r03v02), it is recommended that a Green Travel Plan (GTP) be prepared for the development. The GTP shall influence the travel behaviour of residents away from the use of private vehicles towards more efficient modes of transport including active transport such as walking and cycling; public transport such as metro, rail, and bus services, and carshare services.

*Carshare*

- Section 2.10.9 of the MDCP 2011 refers to opportunities to provide dedicated on-site parking spaces for carshare vehicles which work towards minimising car use and ownership, and particularly notes the following:

  *"Carshare schemes are most effective in areas with ready access to public transport services – generally within Parking Areas 1 and 2." Carshare schemes provide an alternative means by which residents and business operators can have access to a car, and as such, may enable on-site parking for private cars to be reduced. Accordingly, Council will look more favourably on proposed reductions from the rates specified in car parking provision in Table 1 if a carshare scheme is provided on the site."*

- As detailed in the previously prepared TIA report (ref: 0113r03v02) the site is located to the immediate south of Marrickville Railway Station and approximately 7.0 kilometres south-west of the Sydney CBD and therefore in an incredibly accessible area. From review of the MDCP 2011, the site falls within Parking Area 1 and is therefore considered to be within the most accessible area category within the LGA.
- The proposal adheres to and abides by MDCP 2011 Clause 2.10.9 by investigating and adopting the provision of two (2) on-site carshare spaces.
- Consultation has been undertaken with the carshare provider, GoGet regarding the provision of two (2) on-site carshare space. GoGet have response to confirm implementation of two (2) GoGet vehicles would be an excellent addition to this area, given it's location to public transport and other GoGet vehicles. Attachment 2 details GoGet's support. Based on previous research of the Inner West LGA, it is assumed 1 GoGet space replaces 10 private cars.
- The GoGet vehicles will be accessible to on-site residents as well as other GoGet members. Accordingly, the provision of on-site GoGet vehicles will therefore not only benefit future residents of the development but will benefit neighbouring residents who also use carshare services, thus reducing on-street car parking demand in the local vicinity.
- The proposed carshare vehicles will build upon GoGet's existing network of vehicles located in the vicinity of the site, shown by Figure 2, which includes six (6) vehicles within 400 metres and a further eight (8) vehicles within 800 metres of the site. This is an important factor and will ensure that residents have access to a network of conveniently located GoGet vehicles.
- The report titled The Impact of Car Share Services in Australia, prepared by Phillip Boyle & Associates dated October 2016 is included in Attachment 3. This report includes an extensive assessment and economic modelling of carshare services in Australia with a particular focus on the City of Sydney LGA and confirms that each carshare vehicle replaces up to 10-13 private cars.
- The development provides 42 car parking spaces for the boarding house development, including two (2) carshare spaces. Based on GoGet's and Phillip Boyles & Associates research the development therefore

effectively provides a total of 60-66 car parking spaces (40 standard spaces plus 20 – 26 spaces as a result of the GoGet vehicles) which satisfies the numeric requirements of both the MDCP 2011 and the SEPP ARH 2009.

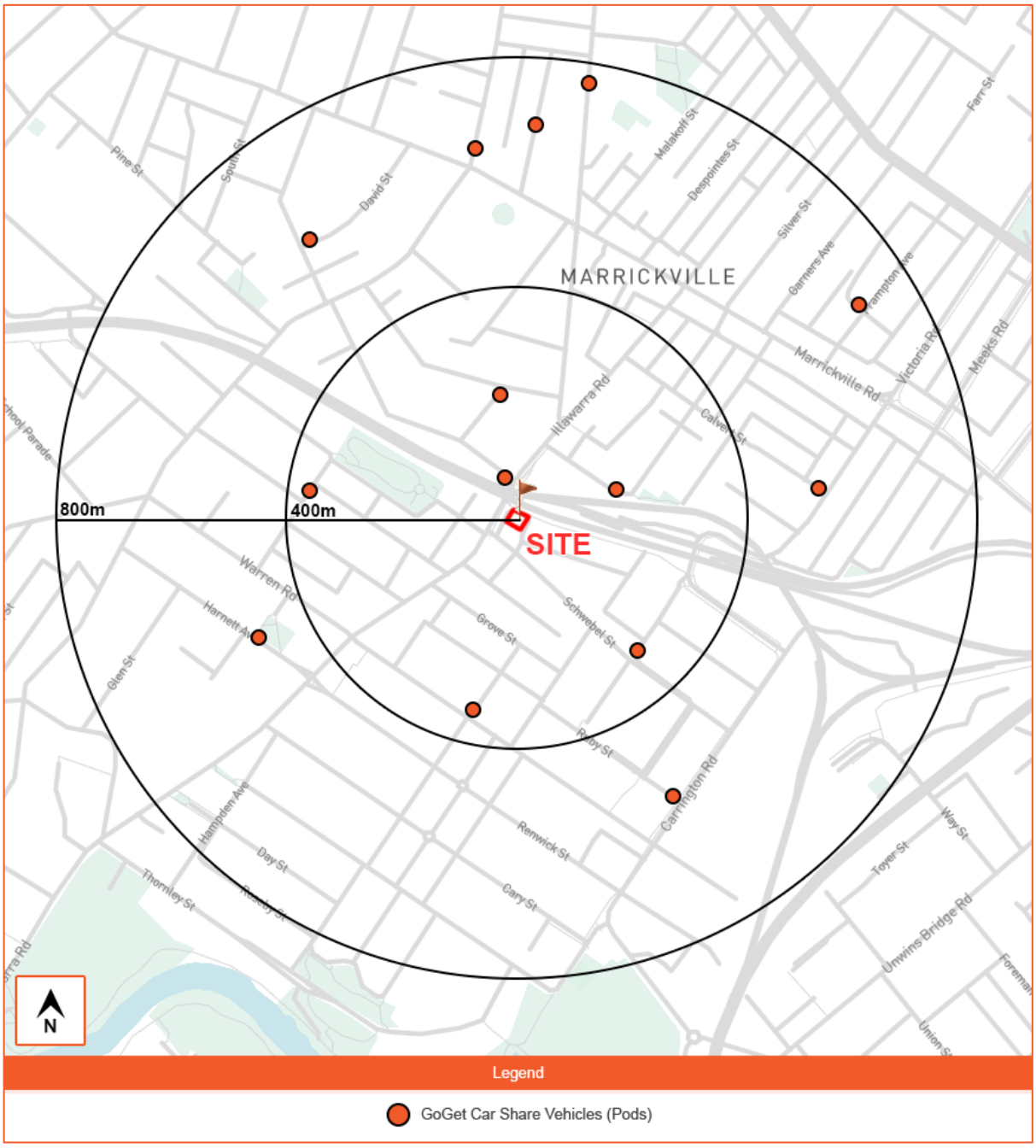



Figure 2: Existing Network of GoGet Vehicles Near the Site

*6. Demographic Sector of the Proposed Development*

- Section 4.3 of the MDCP 2011 recognises boarding house developments are associated with the provision of accommodation for low-income households. It is therefore expected residents living within boarding house developments are less likely to own a private car, resulting in reduced levels of parking demand.

- ABS data for Marrickville (2016 Census data) identified 18.8% of all households within Marrickville do not own a car, which is double that of the NSW average of 9.2%. It is likely households that do not own a car live near public transport.

- The ABS data also identified only 35% of residents travel to work by car (as driver), compared to the NWS average of 58%.

- Further, 40% of Marrickville residents travel to work by public transport compared to the NSW average of only 16%.

- An evident comparison can be drawn that there is clearly a community-wide, high use of public transport within the Marrickville LGA compared the NSW average.

- It is therefore evident that the broad, generalised, NSW average car parking rates provided in SEPP ARH 2009 are not representative of the demographic sector the development targets, or of the Marrickville LGA as a whole. Reduced car parking provisions are therefore considered justifiable within the Marrickville LGA at the subject site.

*9. Provision Consistent with MDCP 2011 Objectives*

- The MDCP promotes sustainable transport and the reduction of car use throughout. Reference can be made to Section 1.1.9 of the MDCP 2011, which highlights Objective 6 'To promote sustainable transport' as one of only ten (10) documented general objectives of the DCP.

- Further reference can be made to Section 2.10.1 'Objectives', which notes specific objectives of the 'Parking' section of the DCP. The proposed development, in providing car parking at a lower rate than specified in SEPP ARH 2009, achieves several of these objectives:

  *O3:* *To improve the integration of land use and transport by applying strict constraints to car parking within accessible areas and more modest constraints in less accessible areas.*

  *O4:* *To ensure parking provision and design is compatible with the particular development proposed.*

  *O5:* *To allow for appropriate variation of provision rates and design parameters for developments with particular characteristics, such as affordable housing or re-use of older buildings.*

  *O6:* *To provide for current and future demand for bicycle parking and to ensure bicycle parking is well designed and located.*

  *O8:* *To ensure all parking facilities achieve positive visual, environmental, sustainable transport and pedestrian safety outcomes through adoption of best practice principles.*

- Section 9.8.2 then identifies the desired future character of the area and aims to promote sustainable transport (public transport, walking, and cycling) by restricting the provision of off-street car parking, increasing provision of bicycle parking and car-sharing (off-street and on-street) and carefully managing general on-street car parking.

- MDCP 2011 also advocates the promotion of sustainable transport by providing higher development density, particularly around Dulwich Hill Station, and restricting the provision of off-street car parking around the station, including increasing the provision of bicycle parking and car-sharing. The same rationale could be applied to other rail stations across the LGA, promoting transit-oriented development as a means of reducing car ownership and dependency.
- As is discussed in further detail in the previously prepared TIA (ref: 0113r03v02), the development will provide on-site bicycle and motorcycle parking facilities in accordance with the MDCP 2011 and SEPP ARH 2009. These facilities will complement the on-site car parking to provide a sustainable transport outcome for the site that encourages the use of alternative transport modes and a reduction in the use of private vehicles.

### 2.2.3 Summary

EPA 1979 specifies that the consent authority, in this instance Inner West Council, is to be flexible when applying DCP provisions and allow reasonable alternative solutions that achieve the objectives of the standards.

The MDCP 2011 frequently and firmly espouses and promotes sustainable transport and a reduced reliance upon private vehicles across the LGA, as well as listing several examples of features which would justify providing car parking at a lower rate than specified in MDCP 2011.

The development, as has been demonstrated above, contains several features which MDCP 2011 list as being valid justification for providing car parking at a lower rate than that specified. As a result, car parking provision proposed for the site is considered appropriate in addressing the requirements of MDCP 2011 and the needs of future residents and visitors.

## 3.0 SERVICE VEHICLE PARKING

*The proposal also does not provide a loading dock. Councils Development Engineers advise:*

*"The application does not comply with controls C24 and C25 of Part 2.10 Parking Management of the Marrickville DCP 2011. A loading dock must be provided to service the proposed large 120 boarding room development which includes 259sqm of retail space. Given the size of the development the loading dock must be designed for a minimum MRV. The Traffic impact assessment wrongly interrupts the Service/Delivery vehicles space requirement as 0."*

The one-way entry to Station Street from Schwebel Street is signposted with turn restrictions that read – 'No Right Turn (or No Left Turn), Vehicles under 7.0 metres Excepted'. An MRV is defined by Australian Standard (AS) 2890.2 as being 8.8-metres in length. This means an MRV is unable to use Station Street to access the site and that only vehicles with a length of less than 7.0 metres are permitted, which corresponds with a small rigid vehicle (SRV) as defined by AS 2890.2, with length 6.4 metres.

Neither the SEPP ARH 2009 or MDCP 2011 provide a service vehicle parking rate for boarding house developments, however Table 6 of Section 2.10 of the MDCP 2011 does provide a service vehicle parking rate for 'residential flat buildings' and 'residential components of a mixed-use development'.

To provide a conservative assessment, these service vehicle parking rates have been relied upon for the boarding house component of the development. It is however noted that residential flat buildings and residential components of a mixed-use development would generally have far higher servicing and loading requirements than a 'new-age' boarding house. Such boarding house developments are constructed fully furnished, and so the changing of tenants or building occupants does not generate the demand for servicing that a new owner of a residential flat would. The assessment given in **Table 3** below is therefore considered highly conservative.

The proposed commercial component of the development has also been assessed in accordance with Table 6 of Section 2.10 of the MDCP 2011. **Table 3** below shows the minimum service vehicle parking rates applicable to the proposed development.

**Table 3: Service Vehicle Parking Requirement & Provision**

| TYPE | NO. / AREA | DCP PARKING RATE | MINIMUM REQUIREMENT | PARKING PROVISION |
|---|---|---|---|---|
| Commercial | 259m$^2$ GFA | 1 truck space / 4,000m$^2$ GFA | 0 | 1 |
| Residential flat buildings and residential components of mixed-use developments | 120 Boarding Rooms | 1 service vehicle space / 50 apartments up to 200 apartments | 2 | |
| | | ***TOTAL*** | **2** | **1** |

It is evident from **Table 3** that in assuming the boarding house will generate the same demand for servicing that a residential flat building would, the proposed development is required to provide two (2) on-site service vehicle spaces under the MDCP 2011. In response, the development provides one (1) courier bay, which can accommodate vehicles with dimensions up to and including a B99 Design Vehicle (such as high-top vans and tradesman utes).

This is considered an acceptable level of provision given that the commercial floor space is only 259m$^2$ and does therefore not come close to necessitating an on-site service bay given the requirements of MDCP 2011. Furthermore, the SEPP ARH 2009 and MDCP 2011 do not provide a service vehicle parking rate for boarding house developments and the above parking assessment has been undertaken as a highly conservative assessment.

The provision of one (1) courier bay is sufficient as these 'new-age' boarding house developments such as the proposed development differ from a typical residential apartment in that they are fully furnished, and as such the requirement for removalists and delivery of bulky goods upon a new tenant moving in or out is eliminated. As a result, the demand for a large service vehicle is significantly reduced and the proposed courier bay is considered acceptable to service the proposed development.

It is noteworthy to clarify the exact requirements of both controls C24 and C25 which stipulate the following:

***C24*** *For larger developments, at least one on-site service area must be provided, with the minimum area for vehicle parking being 7.5 metres by 3 metres. The design of service and circulation areas must consider the type of vehicles delivering to the premises and the type of goods being handled. Developments to be serviced by semi-trailers require particular attention, as those vehicles create significant off-site impacts and consume large areas for movement. It may be appropriate to limit trucks servicing a site to smaller rigid trucks only.*

***C25*** *Proposals must meet minimum requirements for the parking of service and delivery vehicles, as detailed in Table 6.*

As stipulated in **C24** above, the design of service and circulation areas must consider the type of vehicles delivering to the premises. As previously stated, given the proposed development only provides 259m$^2$ of commercial floor space and 'new-age' boarding house developments are constructed fully furnished, the demand for large service vehicles is significantly reduced. The provision of a courier bay accommodating high top vans and tradesman utes is therefore considered appropriate and the proposal meets the requirement of **C24** by considering the type of vehicles delivering to the site and providing servicing facilities accordingly.

As stipulated in **C25,** the proposal must meet the parking requirements of Table 6 in the MDCP 2011. As identified above in **Table 3,** the proposed development meets the requirements of Table 6 for the commercial component of the development and given the nature of the proposed boarding house developments the requirement for a large service vehicle bay is not required.

Accordingly, it is considered acceptable that the development provides one (1) on-site service vehicle bay suitable for vehicles up to a B99 design vehicle. This service bay can be managed between both the residential and commercial component of the development through the implementation of a Loading Dock Management Plan (LDMP) to ensure there are no delivery conflicts.

## 4.0 WASTE COLLECTION

*"The collection of waste or servicing of the site must not occur from the narrow section of Station Street at the east of the site. Station Street is a one-way street that carries a single lane of traffic in a clockwise direction. Loading/unloading activities on this section of Station Street will result the road being blocked to all traffic with vehicles having to wait behind trucks while loading/unloading activities are taking place. This arrangement is unsatisfactory given that Station Street is a very busy local road directly adjacent to Marrickville Train Station with high level of pedestrian movements and vehicles arriving frequently for pick-up and drop-off activities. Therefore, all loading and unloading activities including collection of waste must occur within the site."*

There is currently no existing provision for on-site waste collection for any of the existing occupants of properties at 2 – 18 Station Street, and therefore all existing collection for these premises occurs on-street.

The existing development currently accommodates approximately nine (9) individual tenancies which generate disparate, uncoordinated, and separate waste collection requirements. This results in the requirement for up to nine (9) separate waste collections for each of these individual premises, which must all occur on-street along Station Street, and thus potentially impact general traffic.

The proposed development will significantly improve the existing waste collection situation by consolidating all existing uncoordinated waste collection of these individual premises into the one, well-managed schedule.

The proposed waste collection can be strictly managed by a Waste Management Plan (WMP) and can stipulate all waste collection will occur outside commuter peak periods. An example stipulation might be that all waste collection occur before 04:28am, which is the first train to stop at Marrickville on a typical weekday. This would ensure the impact to rail station users of the 'kiss and ride' service on Station Street are not affected by proposed waste collection activities.

The proposed service vehicle and waste collection arrangements are considered acceptable and are consistent with numerous other comparable developments in the area.

## 5.0 SUMMARY OF MDCP OBJECTIVES

*In considering the above non-compliances with the numeric controls the applicable objectives are O1-O9 in part 2.10.1 of MDCP 2011. It is noted that:*

- *A development of this scale and density is likely to result in parking spill over to the surrounding streets.*
- *The lack of a loading dock means that collection of waste must occur in the public domain, blocking traffic and using the use of the public space around the site.*
- *Deliveries to the retail space will occur in the public domain and spill out on to the surrounding streets.*

- *The proximity to the train station means that on-street carparking cannot be relied upon to offset the shortfall.*
- *The shortfall is as a result of the density of the development being greater than those envisaged within the development controls.*
- *The objectives imply strict application in accessible areas.*
- *The development, while under the SEPP ARH, is not for affordable housing as defined by the Act and is not an adaptive reuse.*
- *The development provides for adequate bike and motorcycle parking.*
- *The parking design appears consistent with the relevant Australian standards.*

*Given the above, and the extent of the development standard breaches, a variation to the numeric carparking and loading dock controls control in Part 2.10.5 of Marrickville DCP 2011 cannot be justified.*

O1-O9 'Objectives' of part 2.10.1 of the MDCP 2011 notes the following:

> *These objectives directly promote Objective (d) of Marrickville Local Environmental Plan 2011 (MLEP 2011) "to promote sustainable transport, reduce car use and increase use of public transport, walking and cycling".*

It is our opinion that Council's above summary does not align with Objective (d) of the Marrickville LEP and DCP Objectives which aim to promote sustainable transport, reduce car use, and increase use of public transport.

It is therefore contestable to stipulate the development breaches policy controls.

As demonstrated in the above sections, the proposed parking provision is suitable and representative of the conditions and features of the site, the requirement for a MRV loading bay is 'impossible' given the constraints of Station Street, and the proposed provision of one (1) courier bay is sufficient.

As such, the proposed development provides an efficient and sustainable outcome from a traffic and parking perspective and the objectives of MDCP 2011 have been taken into consideration and have been met.

## 6.0 ADDITIONAL COMMENTS

*Part 4.3 – Boarding Houses*

- *The application does not nominate a parking space for each boarding room manager as is required by C7 control C4 of part 4.3.3.4 of MDCP 2011.*

Specific reference has been made to Clause 29 (2)(e)(iii) of the SEPP ARH 2009, that stipulates a development is permitted to allocate no more than (i.e. a maximum of) one (1) car parking space for an on-site manager, however this is an optional provision that does not influence the minimum requirement for 59 car parking spaces for the boarding house component.

As per Clause 29(2)(e) of the SEPP ARH 2009, the consent authority is unable to refuse consent to the development on the grounds of car parking if compliance with the SEPP ARH 2009 parking requirement is met. In this regard, it is considered that the proposed development is not required to comply with Control C7 of MDCP 2011.

*Part 9 – Strategic Context*

- *The development does not provide the required level of parking or loading facilities. A development with the adjoining lot is likely to be able to overcome the issues with waste collection and reducing the non-compliances with the development standards would bring the proposal into compliance with the required level of carparking.*

Please refer to Section 2.0 on pages 2-9 for car parking justification.

Please refer to Section 3.0 on pages 11-12 for service vehicle justification.

Please refer to Section 4.0 on page 11 for waste collection justification.

## 7.0 PRELIMINARY CONDITIONS

*6 REFERRALS*
The application was referred to the following internal sections/officers and issues raised in those referrals have been discussed in section 5 above.

*A. Loading Dock*

*This consent will not operate, and it may not be acted upon until the Council or its delegate is satisfied that a suitable loading dock has been provided off Station Street East that will allow for the servicing of the site without impeding on through traffic or pedestrian movements. The loading dock shall be suitable for use by a Medium Rigid Vehicle.*

Please refer to Section 3.0 on pages 11-12 for further detail on the proposed service vehicle bay.

*B. Restrictions for Splayed Corners*

*This consent will not operate and it may not be acted upon until the Council or its delegate is satisfied that the architectural plans have been amended to allow for creation of 2mx2m Splayed Corners at both corners of the building. The splays shall apply to a height of 4.5m above the footpath level.*

To satisfy Council's request, a 2.5 metre by 2.0 metre visual splay can be provided on the egress side of the car park driveway, at the property boundary, in accordance with Figure 3.3 of AS 2890.1. This area will be kept clear of all vertical obstructions and will provide a height clearance of 3.5 metres.

As previously mentioned, the entry to Station Street (from Schwebel St) is signposted with turn restrictions that read – 'No Right Turn (or No Left Turn), Vehicles under 7m Excepted'. This means that only vehicles with a length less than 7.0 metres are permitted to access Station Street. This would be comparable to a 6.4m long Small Rigid Vehicle (SRV) defined under AS 2890.2, which requires a head height clearance of 3.5m.

The above condition requires a splay to be provided at the north-east corner of the building to allow for turn movements by an 8.8m long MRV defined under AS 2890.2, which requires a head height clearance of 4.5m. In this regard, we understand that Council is proposing that the condition include a requirement to provide a 4.5m head height clearance within the splay zone.

It is clear from the above that an MRV is not legally permitted to access Station Street, with the largest legal vehicle being comparable to an SRV, requiring a 3.5 metre head height clearance. In our opinion, it is unreasonable for Council to impose a 4.5 metre head height clearance within the splay zone. As per the above, the splay zone should only need to allow for a 3.5 metre head height clearance to cater for an SRV.

*C. Additional Parking*

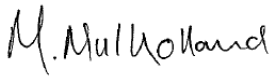
*This consent will not operate and it may not be acted upon until the Council or its delegate is satisfied that the plans have been amended to provide an additional basement level so as to provide an 15 additional carparking spaces.*

Please refer to Section 2.0 on pages 2-9 for car parking justification.

We trust the above satisfactorily addresses the concerns raised in Council's Report.

Please contact the undersigned should you have any queries or require anything further.

Yours sincerely,

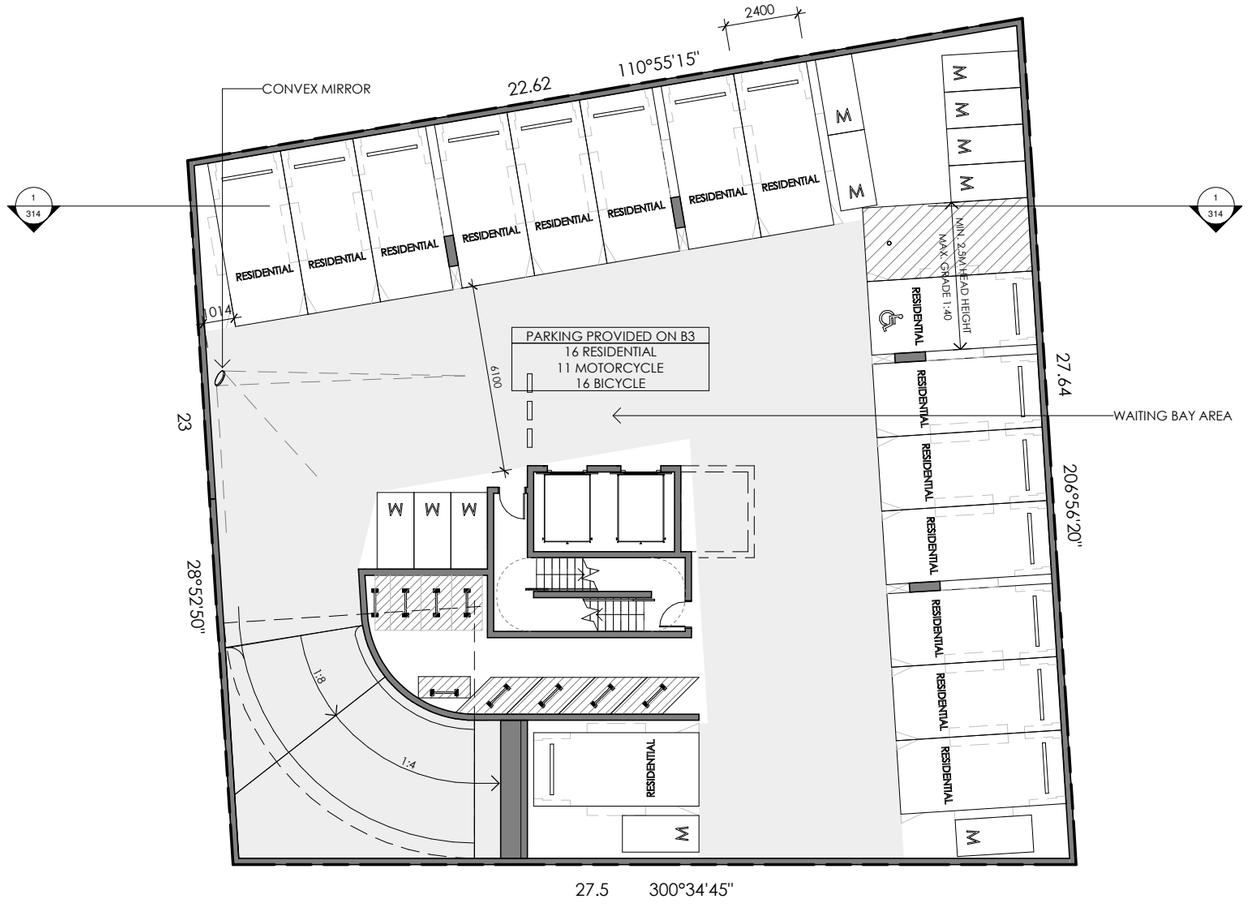


Maria Mulholland
Traffic Engineer, PDC Consultants

Email: maria@pdcconsultants.com.au

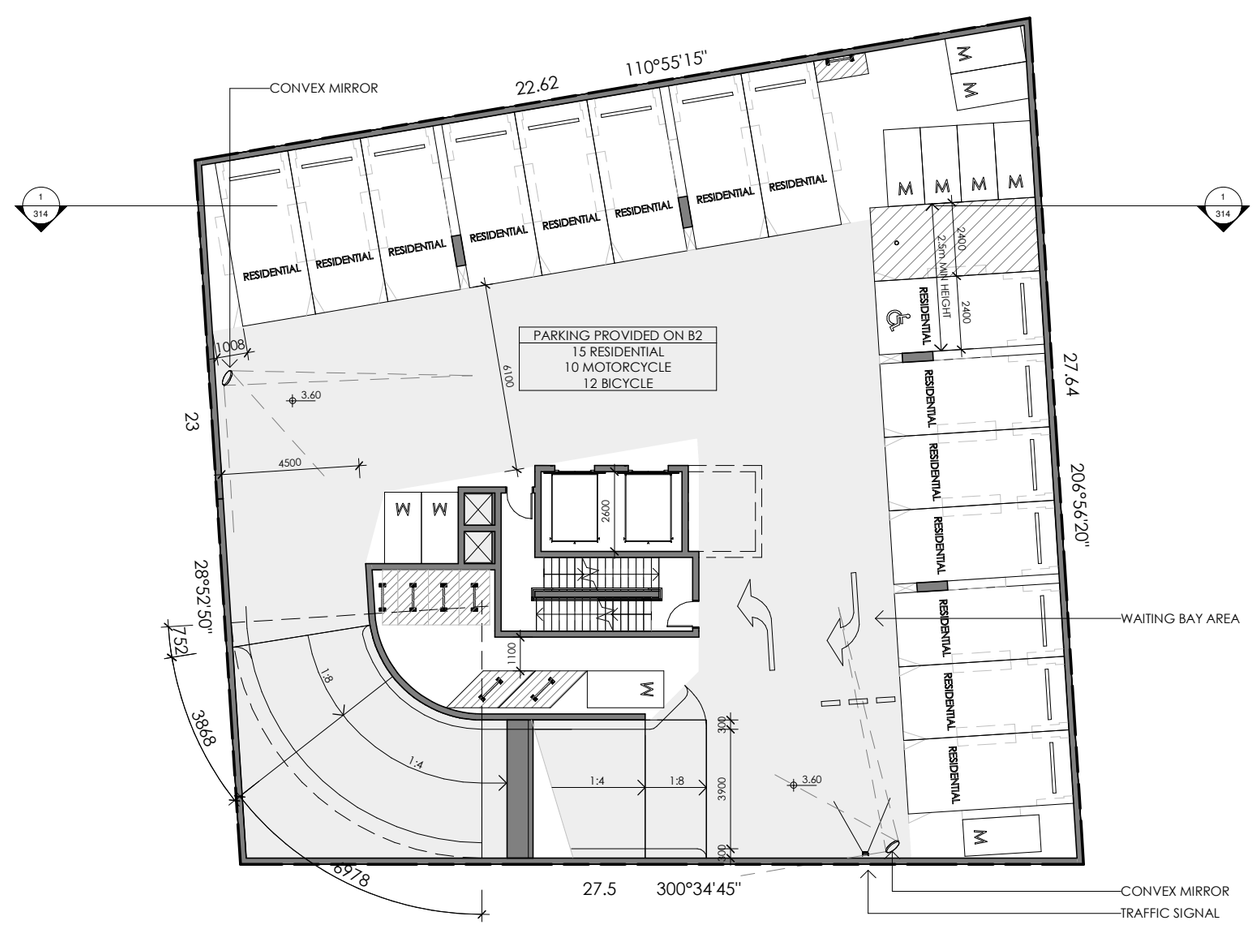
*Attachments:*
*1) Amended Architectural Drawings*
*2) GoGet Support*
*3) Carshare Research*

# Attachment 1




1 BASEMENT 3

1 : 200




2 BASEMENT 2

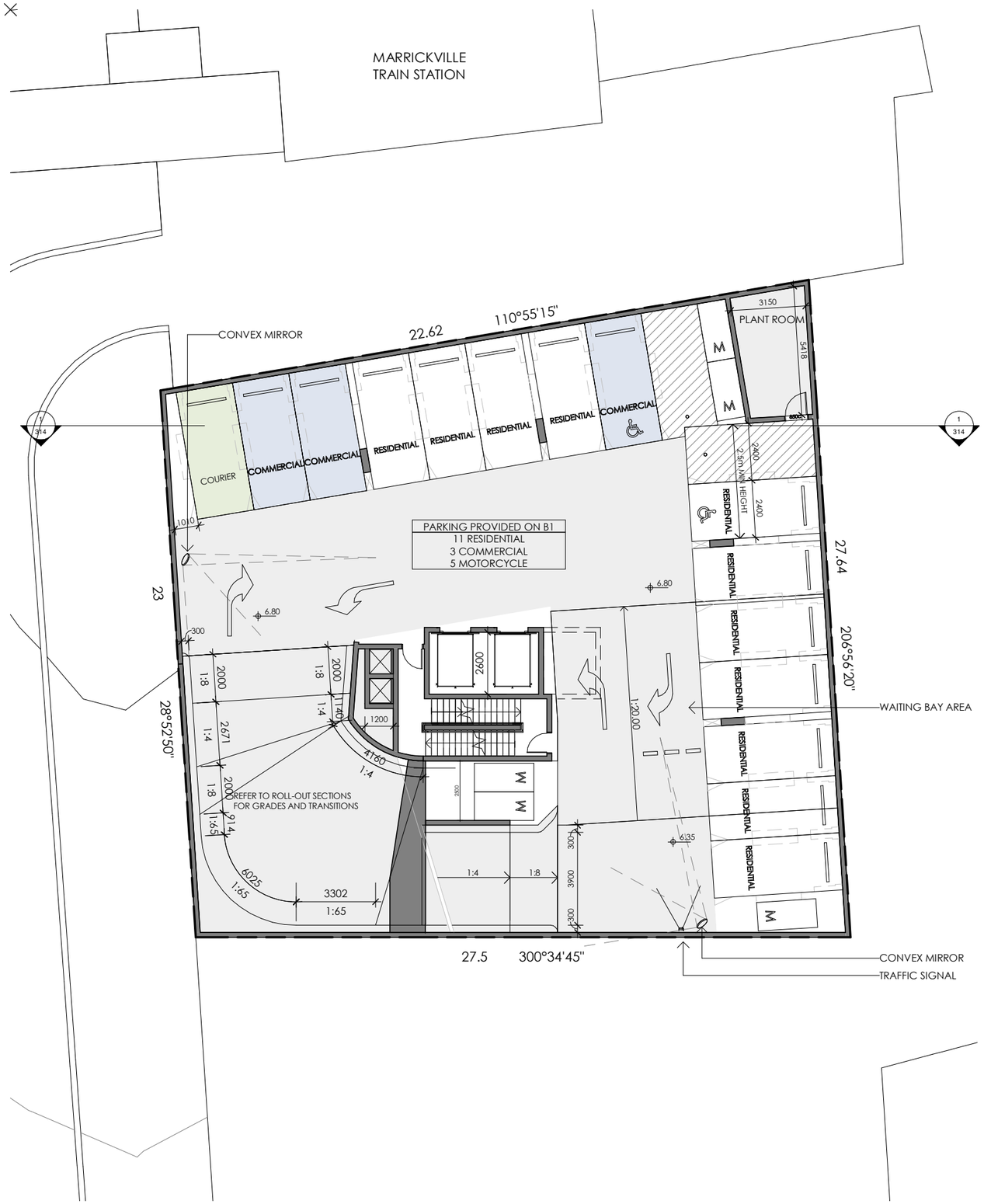
1 : 200

# BASEMENTS 2 & 3 FLOOR PLANS

| ISSUE | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| B | 07/01/2021 | AMENDED PLANS |
| A | 18/05/2020 | DEVELOPMENT APPLICATION |

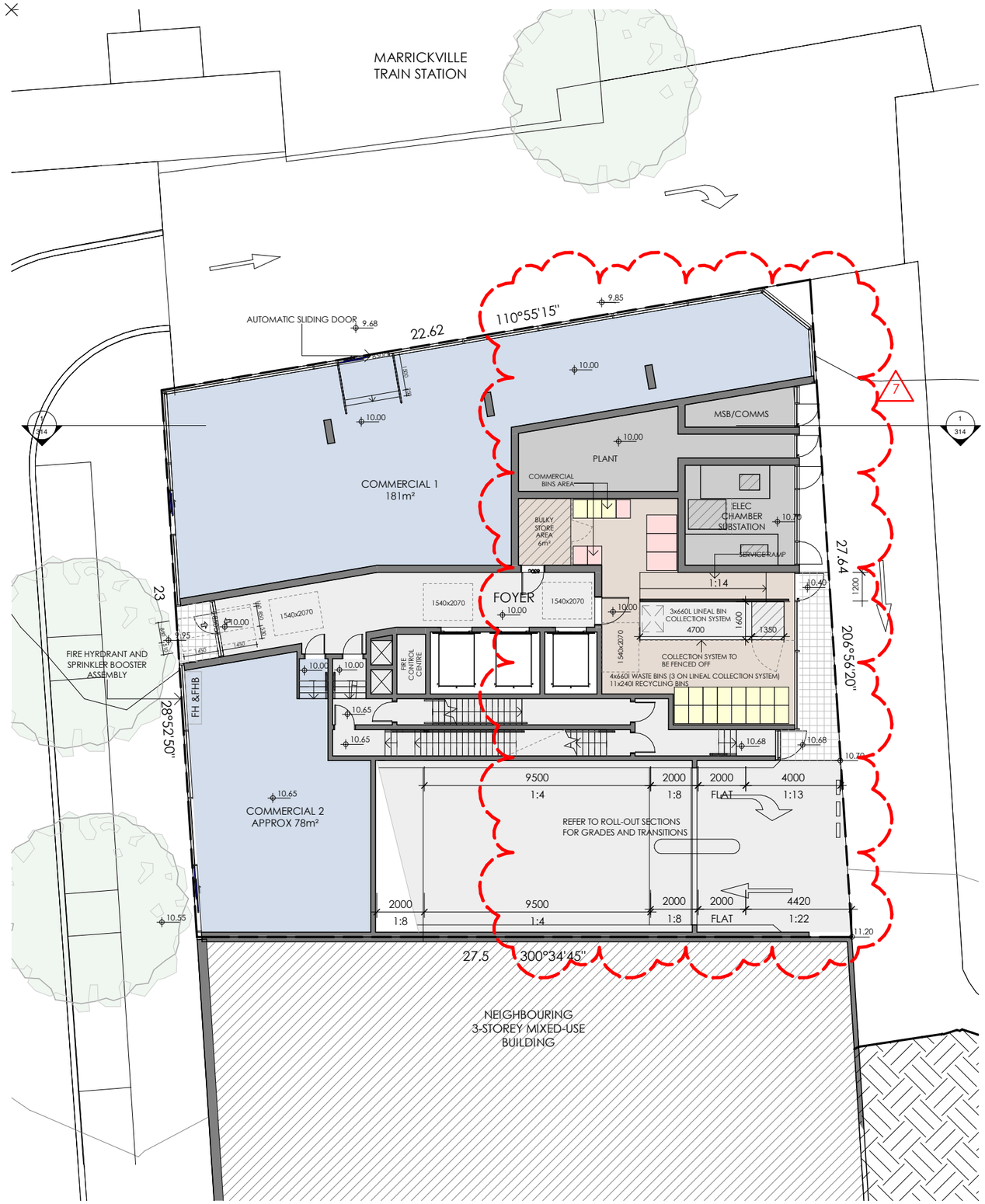
TIER ARCHITECTS

| | | | |
|---|---|---|---|
| CLIENT | EMAG APARTMENTS | DATE 07/01/2021 | SCALE A3 1 : 200 |
| PROJECT | 2-18 Station Street MARRICKVILLE | DRAWN PV | CHECKED NN |
| TITLE | BASEMENTS 2 & 3 FLOOR PLANS | DWG No --- | 303 |




1 BASEMENT 1

1 : 200




2 GROUND

1 : 200

7 - SPLAY ADDED TO NORTH EASTERN CORNER / SUBSTATION MOVED FROM WESTERN ELEVATION TO EASTERN SIDE ALONG WITH OTHER PLANT ROOMS / GARBAGE ROOM INCREASED IN SIZE / MINIMUM 6m TRANSITION TO BASEMENT RAMP

# BASEMENT 1 & GROUND FLOOR PLANS

| ISSUE | DATE | DESCRIPTION |
|---|---|---|
| B | 07/01/2021 | AMENDED PLANS |
| A | 28/09/2020 | DEVELOPMENT APPLICATION |

TIER ARCHITECTS

| | | | |
|---|---|---|---|
| CLIENT | EMAG APARTMENTS | DATE 07/01/2021 | SCALE A3 1 : 200 |
| PROJECT | 2-18 Station Street MARRICKVILLE | DRAWN PV | CHECKED NN |
| TITLE | BASEMENT 1 & GROUND FLOOR PLANS | DWG No --- | 304 |

# Attachment 2

## Maria Mulholland

**Subject:** FW: Letter of Support - Proposed Boarding House - 2-18 Station Street, Marrickville

**From:** Christopher Vanneste <Chris@goget.com.au>
**Sent:** Wednesday, 26 May 2021 9:52 AM
**To:** Ben Midgley <bmidgley@pdcconsultants.com.au>
**Subject:** Re: Letter of Support - Proposed Boarding House - 2-18 Station Street, Marrickville

Great spot Ben.

We would recommend they sign an agreement (which ends if DA not approved). We have seen some problems with Inner West DA conditions.
If they sign an agreement I can do this development at no cost, otherwise with letter of support it will be a once-off of $20,000 if approved.

**Christopher Vanneste PhD**
Head of SPACE

GoGet Carshare
Sydney, NSW 2000

Wheels for whatever.
Round the corner.
By the hour

Mobile 0404 863 228

On Wed, 26 May 2021 at 09:43, Ben Midgley <bmidgley@pdcconsultants.com.au> wrote:

> Hi Chris,
>
> I'm working on behalf of a developer who proposes a boarding house at 2-18 Station Street, Marrickville. He would like to provide two (2) GoGet Car Share vehicle as part of the Proposal; however Inner West Council have asked for a Letter of Support from GoGet to accompany the DA submission to Council.
>
> If GoGet would be interested, would you be happy to provide this Letter, ideally by Friday 28th May?
>
> Many thanks,
>
> **Ben Midgley**
>
> Principal Traffic Engineer

+61 413 167 797
bmidgley@pdcconsultants.com.au
www.pdcconsultants.com.au
www.linkedin.com/company/pdc-consultants
Level 14, 100 William St, Woolloomooloo NSW 2011

# Attachment 3

PHILLIP BOYLE & Associates

# The Impact of Car Share Services in Australia


## FINAL Report

### International Car Sharing Association

**13 October 2016**

PHILLIP BOYLE & Associates

This page is intentionally blank

PHILLIP BOYLE & Associates

# Executive Summary

This review has been commissioned by the International Carsharing Association to understand the impact of fixed base car share services in Australia after a dozen years of operation.[1]

The review aims to improve the partnership between local governments and car share service providers in Australia and around the world. By doing so, this will ensure that the community – including those who do not use the service – receive in full the benefits of the service. The report:

- Considers the Australian car share service which supports 66,000 users accessing 2,200 vehicles
- Draws on experience from Melbourne and Sydney where 90% of the members and vehicles are based
- Focuses in particular on the City of Sydney, which has the largest network in Australia with 20,000 users (equivalent to 20% of the resident population of the municipality) using 805 vehicles (162 in off street locations)
- Considers the service from the point of view of local governments who are responsible to the community for the scale of the service in their municipality.

Over the last decade the City of Sydney has consistently facilitated the expansion of the local car sharing services to the benefit of their residents and local businesses. The City hosts the largest car share network in Australia with an uptake five times greater than the next largest network in the City of Melbourne. This network scale makes the City of Sydney a relevant case study for analysis to both point the way for other municipalities, and identify weaknesses in the current approach with respect to future urban mobility challenges and international best practice.

Over many years a proportion of the people who lived in higher density, inner metropolitan areas of Melbourne and Sydney have maintained the ownership of a lightly used car. Because this group could reach many destinations by walking, bicycle riding and public transport, and because these modes were more convenient, they tended not to use their cars very much. These people maintained ownership in order to have a vehicle to hand when they wanted (or needed) it. When fixed-based, short-term rental services (now known as car share services) became available, the low-car-use group began to switch from low-use ownership to low-use services.

Car share users who previously owned a vehicle often find that their motor vehicle use falls even lower when they switch to car share services. This is because the true cost of the additional car journey is fully understood (and would need to be paid for). They also find that they maintain convenience and mobility as well as having more money in their pocket, for example by releasing the capital locked up in the vehicle and avoiding operating costs such as fuel, insurance, maintenance and registration.

**Benefits to Councils and communities**

Thanks to the investment of the car share service providers and the support of Councils, there is now a market in which car 'services' can compete with low-use car ownership. The report considers 'why' Councils should support these services and identifies a number of value-based reasons.

When people switch from low use car ownership to services, significant value is generated for the household and the community in which it is located. This is especially the case in areas where the population is rising and, in tandem, the resident vehicle fleet is expanding.

The report considers the community benefits that flow from the switch out of ownership:

- Less car ownership: moving from ownership to services reduces the resident car fleet. For every car share vehicle in the network there will be ten fewer privately owned vehicles in the

municipality[2]. This reduction in the number of vehicles is of great value when the number of resident vehicles is equal to or greater than the available kerbside storage space. The car share fleet in the City of Sydney alone has taken around 10,000 cars from the municipality.

- Less car use: car share users in the City of Sydney reported travelling by car less than before – around 2,000 vehicle kilometres less each year. This reduction in vehicle kilometres is of great value in reducing congestion, pollution and road trauma while increasing public health. The City of Sydney car share network has reduced VKT by up to 37 million kilometres each year. Users of car services replace car trips with trips by public transport, walking and by bicycle. These positive steps are also a focus of Council policies.
- Drivers who do not use the service benefit from the reduction in competition for road space, parking at destinations and kerbside storage.

The community benefits that derive from lower vehicle ownership and use explain why the City of Sydney and other municipalities have supported the development of car share services.: 'the City believes this [support for car share services] is a worthwhile investment as car share reduces demand for on-street parking and traffic congestion.[3] The City of Sydney car sharing policy states 'Greater uptake of car sharing will consequently reduce total driving and on-road congestion.'[4]

Individuals also benefit from reducing car ownership and use. Reducing car ownership allows households to reduce household transport expenditure significantly. Buildings with less or no car parking are cheaper to build – one the architect developer calculated that the car park free apartments were $30,000 cheaper to provide[5] – this lower initial cost can represent a saving five times greater over the life of a loan. Some studies estimate that the majority of this financial saving is then spent in the local economy.

### Model

These benefits have been modelled in relation to the City of Sydney using the elements that can be measured and where economic values can be established. The estimate of benefits has been conservative and based on established assumptions published in the *Australian Transport System Management Guidelines.*

From an economic perspective it should also be noted that some positive impacts (including some health benefits and the value land released by car share networks) have not been included in the model and the model therefore under-estimates the annual benefits of the car share network. A number of other important positive values have been left out of the model because a suitable generalised measure or value assessment has not been available.

The model suggests that for the current service:

- Each car share vehicle in the network is estimated to represent $60,000 in value (net) to the City of Sydney community:
  - The total benefits of each deployed vehicle, including reduced congestion and improved road safety, are estimated to be $71,000
  - The annual costs of each deployed vehicle to the community, including the opportunity value of the area of kerbside space and the mode management, maintenance and administration costs to the City of Sydney, are estimated to be $11,500.
- The City's support of the service delivers a return of $6.16 for $1 of investment
- The total net annual benefit to the community of the current car share network of 805 vehicles is $48 million.

### Mode manager

The report considers 'how' Councils can support the service through their role) as mode managers of this unusual and innovative mode.

It might be thought that if Councils discovered a 'magic potion' that catalysed mode shift, reduced pollution, reduced the cost of housing and made congestion (both traffic and parking) disappear, that they would be united in their determination to sprinkle as much of this magic potion as possible across their municipalities. It might be thought that the support would be even greater if the users agreed to pay for the service and for someone to manage it and that the benefits would accrue to everyone in the municipality.

Surprisingly this support has not always been there. The report considers how and why this has occurred:

- At the strategic level Councils face a strategic decision to support, be neutral or suppress the benefits of a switch from low use ownership to low use rental. This decision is similar to the decision faced by Councils considering bicycle transport.
- In order to implement the strategy, the Council needs to manage the mode in a similar way to the role they play with other services such as rubbish collection and libraries. Councils set standards for the network including matching demand, offering equity of access, service reliability, clarification of roles and responsibilities, disciplinary action and regular reporting.
- For users the service is based on a network of nodes laid out, like pieces on a Chinese chequers board. Generally, the planning of these networks is left to the service providers, yet the distance between nodes has a significant impact on the community in terms of equity and access.
- Most car share nodes in today's networks are kerbside. Allocating kerbside space is always challenging but it is vital for the success of the service. In some municipalities, kerbside space allocation sets the 'in practice' strategy for the service.
- The service providers seek to locate vehicles in off street spaces. Most Councils have not developed an integrated approach with their statutory planning divisions or through representation to the State Government.
- Social programs are used to stimulate walking, bicycle riding and public transport use but Councils rarely use their high level insights into the urban form or their influence with residents to recommend, encourage or facilitate growth of car share networks and services.
- Unlike Councils overseas, few have used the service to supplement and replace some part of the Council vehicle fleet.
- Councils require detailed performance reports from the service providers but generally do not provide regular internal and public updates on the service as are provided for other modes by State Governments.
- Taxes and charges are applied by Councils that understand the service as 'parked cars' managed by a 'business' – both traditional sources of revenue to municipalities. Other Councils see instead a service like a library or define the service as public transport. This is another area where 'in practice' strategy is set.

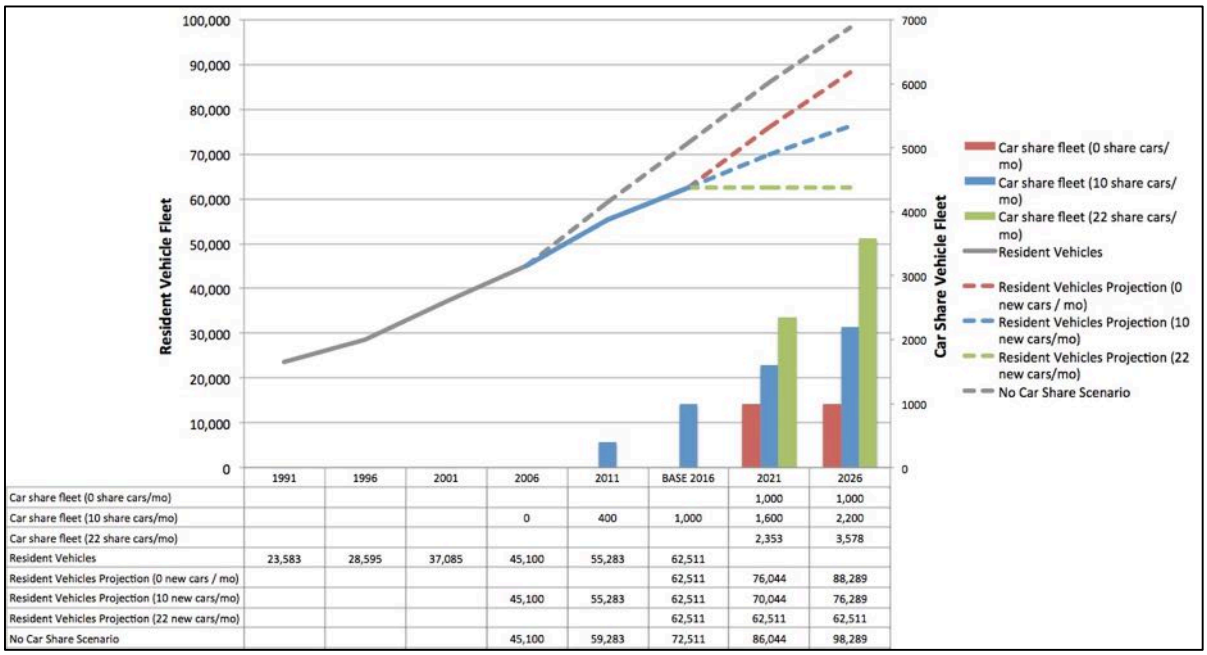
### Choosing a desirable future

For the first time thanks to the availability of privately funded, resident supported car share services, Councils such as the City of Sydney can adopt policies that will directly influence the level of car ownership and use, choosing a future with more private cars or less. Four scenarios are described in the report:

- **Remove car share and significantly increase the number of resident vehicles**: In theory, the City could wind the clock back and remove the current car share service. The consequences of this would be to add 10,000 more vehicles to the city streets and kerbside parking spaces and expect another 14,000 vehicles to be based in the City by 2021 – a total increase of 24,000 additional motor vehicles. This trend is shown by the grey line in Figure 1 below. It is unlikely that either the users of the current service or the other residents of the City would support this approach.

- **Freeze car share growth and accept an increase in the number of resident vehicles**: Any municipality could ignore an increasing membership and use of car share services and freeze the service at current levels. Many municipalities in Australia have made this choice. The consequences of this for the City of Sydney would be that another 14,000 vehicles would be based in the City by 2021. This trend is shown by the red line in Figure 1 below. This addition to the resident vehicle fleet would require parking equivalent to that provided at Sydney Airport.
- **Business as usual – continue to grow the car share fleet and the resident car fleet.** Many municipalities have adopted policies that endorse this approach. The consequence of this approach for the City of Sydney would be an increase in the car share fleet from 1,000 to 1,600 vehicles (equivalent to 3% of the resident vehicle fleet) and an increase in the resident vehicle fleet of 10% or 6,000 cars. This trend is shown by the blue line in Figure 1 below. The additional resident car fleet would still need half a Sydney Airport car park for storage.
- **Strategic expansion – avoid all growth in the resident vehicle fleet.** One municipality in Australia (City of Port Phillip) has recognised the importance of this goal. This goal can be achieved in the City of Sydney by increasing the car share fleet to 2,500 vehicles. At this scale the car share network would be equivalent to 5% of the resident vehicle fleet. This trend is shown by the green line in Figure 1 below. Such an expansion should ensure that the resident vehicle fleet does not grow between 2016 and 2021.

FIGURE 1: STRATEGIC SCENARIOS




| | 1991 | 1996 | 2001 | 2006 | 2011 | BASE 2016 | 2021 | 2026 |
|---|---|---|---|---|---|---|---|---|
| Car share fleet (0 share cars/mo) | | | | | | | 1,000 | 1,000 |
| Car share fleet (10 share cars/mo) | | | | 0 | 400 | 1,000 | 1,600 | 2,200 |
| Car share fleet (22 share cars/mo) | | | | | | | 2,353 | 3,578 |
| Resident Vehicles | 23,583 | 28,595 | 37,085 | 45,100 | 55,283 | 62,511 | | |
| Resident Vehicles Projection (0 new cars / mo) | | | | | | 62,511 | 76,044 | 88,289 |
| Resident Vehicles Projection (10 new cars/mo) | | | | 45,100 | 55,283 | 62,511 | 70,044 | 76,289 |
| Resident Vehicles Projection (22 new cars/mo) | | | | | | 62,511 | 62,511 | 62,511 |
| No Car Share Scenario | | | | 45,100 | 59,283 | 72,511 | 86,044 | 98,289 |

*Sources: Population; ABS Census Estimated Resident Population Resident Cars; 1991 to 1996 - id Profile, 2001 to 2011 - ABS Census, 2016 to 2026 ABS resident forecasts*

PHILLIP BOYLE & Associates

# Contents

PHILLIP BOYLE & Associates

# List of Figures

# List of Tables

PHILLIP BOYLE & Associates

# 1. Introduction

Car share enables people who need a car from time to time to rent 'car services' rather than own a vehicle, store and maintain it. A growing number of people are finding that these services are cheaper and more convenient than ownership. The household savings generated by the switch have a number of beneficial impacts.

The switch from owning to renting changes people's travel behaviour. Car trips switch from being the default to an option. Car share users continue to make car journeys but, compared to owners, they choose other options more frequently and overall do not travel as many kilometres in a car. This change has a social impact. Pressure on limited road and kerbside space is reduced. Pollution and other consequences of car travel are reduced.

The switch also reduces the size of the private vehicle fleet and storage required. Space that is currently set aside for vehicle storage in buildings and at the kerb can be put to higher value uses.

Many local governments have supported and facilitated the establishment and growth of car share services from the start. They recognised the wide-ranging strategic benefits including housing affordability, environmental sustainability and public health. They appreciated the chance to address difficult problems including congestion and parking stress.

By the end of the 2015 financial year the Australian car share service was supporting 57,000 users accessing 2,200 vehicles

Nowhere in Australia has the growth of car share services been as great as in the City of Sydney. Today the number of people who belong to car share service schemes in the municipality is equivalent to 20% of the resident population. The City has led all Australian municipalities by facilitating a network of nearly one thousand cars to be deployed taking around ten thousand vehicles off the City's congested roads, overloaded kerbside space and out of commercial and residential buildings.

To date the City of Sydney has implemented good policy in a strategic manner that has generated the highest benefit of any municipality in Australia.

Despite this success and the leadership example of the City of Sydney, car share services are at a crossroads in Australia. In the early days of the service, many municipalities were enthusiastic about supporting innovative start-ups that offered an unexpected alternative to the world of transport. The small scale of the services meant that no existing policies, practices or paradigms were challenged.

As the services have grown there has been a noticeable waning of enthusiasm. Some municipalities have moved from being strong supporters to neutrality, others have moved from cautious neutrality to an implicit or explicit freeze on growth. Even the City of Sydney has suspended some of its key support initiatives.

This cooling is not a reflection of a reduced enthusiasm among users and potential users of the service. User numbers continue to grow. Nor does it reflect a change in strategy by the service providers who are keen to improve the reach and reliability of their services.

The cooling comes from Councils. In some municipalities the cooling reflects a strategic uncertainty by Councils about the relevance, importance and value of the service. In some places Councils are unsure what the appropriate support and facilitation mechanisms should be.

In a context where it is becoming clear that the supply of parking has reached its peak, the scale and growth of the service is starting to cause comment.

This situation is putting established Council policies and management techniques under stress. Compounding these factors is an underlying problem – the service is still not well understood. In general it has penetrated into the community more successfully than among elected representatives and senior staff.

The Carsharing Association has commissioned Phillip Boyle & Associates to report on the state of car share services in Australia including:

- To describe the relevance and importance of car share services at a strategic level
- To identify the benefits and costs of car share services and to quantify them in a manner that enables the value (or cost) of different service scales to be estimated
- To identify the factors that are influencing Council decisions about the service
- To describe the pathways that Councils can take in relation to the service.

The report focuses on fixed base services as these services have demonstrated in a number of contexts that they support a migration away from car ownership.

Recognising the City of Sydney's success and leadership position, the review focuses on that municipality, drawing on the experience and circumstance of other Councils as necessary. The review speaks of Councils in general but unless specifically mentioned this general term refers to inner urban and CBD Councils where car share services are, or could be, relevant.

PHILLIP BOYLE & Associates

# 2. People choosing liveability over mobility

In general, adults who live in the metropolitan areas of Australian own a car[6]. Those who don't are in a minority. The minority may not be permitted to drive (potentially have a disability) or chose not to own car (for a range of reasons including financial).

This was not the case before the Second World War. In the 1930s most Australian city dwellers did not own a car. Cars were expensive to buy and run and the alternatives were strong (as most land use had been developed around fixed rail networks). Sydney, for example, had one of the largest tram systems in the world. Today there are signs that in the inner suburbs the pendulum is swinging back, and more people find they can have an attractive way of life without owning a car.[7] Such a non-car owner (and in some cases a non-licence holder) would be a familiar character in central London or Manhattan but is less common in Australia.[8]

Non-owners are not living a life of mobility abstinence with diminished opportunities, nor are they necessarily making a values statement – they have found that there is an acceptable, even desirable way of life that does not include car ownership.

One of the reasons that people find themselves in this new way of life, or consciously adopt it, is because of cars themselves.

### The problem with car travel

Cars themselves have never been quieter or more comfortable. They are cheaper to buy and cheaper to run – though perhaps more expensive to maintain and repair. Cars use less fuel and are easier to drive. However, none of these improvements have been able to tackle a growing problem - cars are not as convenient a mode of transportation as they used to be especially for inner city residents.

There are three problems with cars for transportation: congestion, parking and storage[9]. Congestion has made cars a slow way to travel. Average speeds on surface roads in the peaks in Sydney can be as low as 11kph.[10]

Parking can be inconvenient even when it is paid for, and availability at one's destination is unreliable.

A car spends most of its life in storage. A busy car, for example one that travels 15,000km each year, spends 5% of its time in motion, 10% of the time parking and long periods in storage. 95% of the time it is stationary. The longest periods of immobility for a car are storage at work and storage overnight at home.

Daytime storage is not a concern for most people working in the inner suburbs[11]. For those who do drive to work storage is not hard to find but it does add to the cost of the trip. The big problem for people who live in the inner city is storage at home.

In suburbs where house blocks are 15m wide the kerbside storage supply can allow for three cars to be parked. But in inner areas where blocks are around 5m wide there is only enough kerbside storage supply for a ration of one car per household – less if we allow for other uses of kerbside space and other users of kerbside parking – more if the road is wide enough to allow angle parking.

This limited supply can be managed through rigorous rationing and allocation policies supported by unavoidable enforcement. This is not the norm.[12] As a result competition for kerbside storage is intense. In some situations people are reluctant to use their cars for a short or low value trip because of the difficulty of finding a space to store it on their return.

### Shifting trips to alternative modes

On the other side of the ledger, the various alternatives to car travel have been improving their competitiveness, attractiveness and availability.

When car travel for inner city residents was at 'maximum convenience', the alternatives were not very attractive. A self-reinforcing mechanism was operating, fewer people wanted to catch the train, walk to school or ride their bike to the shops so little was done to support those choices. This meant fewer people took the option and the support was reduced and so on.

Today this mechanism is spinning in the other direction. More people are catching public transport, walking and riding bikes. More is being done to support those choices and so more people take up the option. As a result people are finding that there are better options for some of their car trips and for some trips are choosing to leave their car at home. This is quite significant.

There is a rule of thumb that people do around two-dozen trips in a week. Getting to work accounts for ten of those trips. Shopping, visiting friends and so on make up the rest. The rule of thumb suggests that on average people do something away from home every other night – four trips on say four days (16) and two trips on three days (6) comes to around two dozen. Some people do more and some less. Back in the time of inner city maximum car convenience all these trips would be done by car.

In 2011 only 22.7% of trips to work by residents of the City of Sydney were by car, 29.5% caught public transport and 25.3% went on foot.[13] Well over half the population do not need a car to get to work. Once this trip has been switched away from the household car, other trips can follow. People find that they can do local shopping on the way home, do the supermarket shopping on the Internet, and catch a cab out in the evening so they don't have to count their drinks. One by one, each alternative trip convinces these people that their car is of only limited use.

### Low use private cars

In this situation many people keep their options open and continue to own a low-use car. In fact the cost of their car travel rises as they travel less but this is usually not perceived. However when larger bills come in for registration or major repairs, people weigh up what they getting in return for owning a car that they don't use very much.

For an inner city household with two cars it is not a big step to sell the car that is used the least. These people have the best of both 'ways of life'. They can use the alternative transport system when it suits and use their car when it is the most convenient choice. And this is where – up until now – things would rest.

As with so many things, technology has changed people's options. Chip cards and satellite communications have allowed the remote management of a fleet of dispersed vehicles that are available to pre-approved users. Now it is possible for someone who only needs a car every so often to use 'car services' rather than be an owner operator. Not only is this possible it is desirable, as we will see, because when an expensive item like a car is rarely used, 'services' are cheaper than ownership.

### Cultural barriers

Not every low-use car owner switches over to car services, as there are many systemic and cultural barriers to change. A key systemic barrier is the scale and reach of the car share service network. The service network needs to be within 200m of the trip origin and there need to be enough vehicles so that all members can access one at the times they want to travel by car.

Even when these network barriers are overcome, the cultural barriers remain.

Our culture understands 'services' but 'ownership' is a cultural norm. Washing machine services are available at the Laundromat but most people have a washing machine at home.[14] Most people also expect 'most people' to have a washing machine and a car. This expectation affects the view that non-users have of car share services. It can be seen almost as foolishness or a dereliction of some undefined social duty.

We are familiar with the idea that there is a class of assets that are sometimes owned and sometimes used as services. Some people have their own swimming pool others tend to buy books while others choose to use the local municipal swimming pool or library. These choices do not violate any cultural expectations – although they may reflect wealth or disposable income.

However at the moment cars are not in the cultural category of assets that can either be owned or be a service. In exceptional circumstances, such as an overseas holiday, people hire a self-drive car but the idea of continuous car rental at home is outside normal expectation. Nor can car owners who have strong emotional links to being in and owning a car understand how a rented car could not only be an adequate substitute but also support an acceptable 'way of life'.

This dissonance affects the management of car share services by local government – most of the people making decisions about the mode do not use the services (and potentially do not understand why they even exist). It also affects the view of the general public, which also influences how the services are treated by local government.

### Money is the motive

Someone who makes the change from owner/operator to user of car services has to cross all these cultural barriers. They do this because they expect to save money.[15] Some people have a large amount of capital sunk in a car and there are good financial reasons for liquidating the asset and redeploying the funds to better financial effect. There are many more effective investments than a car as in general they steadily lose capital value. Lump sums from the sale of a car can be redeployed to savings, to pay off or start a mortgage or to start a business. This financial liquidation of each car has value to the individual and local community.

Large out of pocket expenses for registration, insurance or maintenance can be avoided – as noted these costs can be a catalyst for the switch. Parking, tolls, fines and insurance excess payments remain the same. Running costs such as petrol appear to go up as the per-hour rate for the service covers all costs.

The per-hour costs for car share are less than $15 an hour for everything including fuel. $1,000 will give someone 60 hours of motoring – enough to drive for 2,500km at 40kph. Car share users will also have to pay for destination parking – though not for storage.

Overall using services rather than owning a car means the total household transport budget goes down. These savings will be spent somewhere – some investigations[16] suggest a high proportion is spent locally including on more entertainment. It is likely that local spending will rise, as the quick trip across town to get a small discount is unlikely to be made in a car share vehicle.

Most significantly the person who uses car services can buy or rent an apartment without a car park. This reduces the entry price and the compounded cost of the mortgage or the rental fee that they will need to pay. In some Australian examples developers have avoided building basement car parking thanks to car share services.

At this point the individual has received the direct benefits from their decision to switch but the story continues, because from this point on, the community benefits begin to flow.

### Wider benefits

First of all, the service user reduces their VKT or vehicle kilometres travelled each year.

The typical private car in Australia travels 15,000 (VKT)[17]. This can be compared to a 'white delivery van', which travels double this distance[18] and a taxi, which travels ten times this distance.[19]

The typical resident of the City of Sydney travels 3,525 km each year.[20] Car share users cut this by around 2,000 VKT. (See Appendix A)

This reduction comes about for a range of reasons, most significantly because the price of each additional car journey is considered more carefully.

For car owners their next car trip is perceived as 'free' because all the costs of the trip – purchase, registration and fuel for example – have been paid before the trip is considered. This means that vehicle owners tend not to weigh up whether to make a particular trip by car. As a result, the car is used for trips that could be better made by other means. Even in Europe 30% of trips made in cars are for distances of less than three kilometres.[21] A 2010 survey by the Victorian Department of Transport found more than 60 per cent of weekday car trips to train stations were less than three kilometres, and 10 per cent were less than one kilometre.[22]

Unlike owners, car share users pay a fee, in the order of $15 an hour, every time they use a vehicle. As a result, the next trip for them is not free but is perceived as a 'loss' to be weighed against the gain from the purpose of the trip. Faced with this payment decision, car share members find that they can undertake many more journeys by walking, bike riding or public transport. As a result, the car share user's VKT is half that of an owner in the same circumstances. When trips and VKT go down, a number of benefits accrue to the community including reduced congestion (traffic & parking), pollution and road trauma.

One of the consequences of this further trip switching is that the individual does more physical activity either by walking, riding a bicycle or using public transport. This change has an individual benefit as well as a collective public health benefit, in particular preventing diseases caused or exacerbated by physical inactivity such as heart disease, some cancers and diabetes.

The user of 'car services' still uses a car to go shopping or visit friends but, because they are switching trips that used to be car trips, they are not competing as much for kerbside or off-street parking. These avoided trips take pressure off the supply.

Most importantly when someone switches to services rather than ownership they no longer need to store a vehicle in the street near their house. Or rather they only need to store 1/20$^{th}$ of a vehicle as 19 other people (on average) can use the same car.

In fact for each group of 20 people who support a car share vehicle, ten cars will have been removed from the local residential fleet. Surveys of car share members have found that, half reduce or avoid car ownership and the other half use the service as a back up household car.

Reductions or disposal of an existing vehicle can occur before the switch, to avoid an expensive repair for example, but typically they occur up to eighteen months after members join the service once they are convinced about costs and reliability.

As a rule of thumb, each car share vehicle represents ten cars that have been disposed of or avoided, resulting in a net reduction of nine vehicles[23].

The overall effect of the service is to reduce the total number of privately owned vehicles based in the City, which in turn releases space at the kerb and in buildings for other uses or users including taking pressure off the kerbside storage supply.

# 3. The value of lower levels of car use

One of the important contributions of car share services to local communities is to reduce the number of car trips made by users of the service. This section identifies the categories of value that flow from a reduction in car use. It is possible to calculate the value of most of these categories by applying the reduction in vehicles owned or vehicle kilometres travelled (VKT) to available generalised metrics.

## 3.1. LOWER USE – LESS CONGESTION

Congestion is a significant problem. By lowering car use, car share services address the problem directly. This connection has been made explicitly by the City of Sydney.

Local government in Australia does not have many opportunities to directly influence traffic and parking congestion in their local area. More often than not the opportunities that do exist are quite expensive (such as build more parking).

There are three ways to respond to congestion:

- Increase the 'supply' of road space
- Move people more efficiently in the same space
- Change the level of demand.

### Increase supply

In general every road transport system in an urban centre has a fixed supply of road space in width and length. It is possible to increase the supply at the margins by purchasing land and demolishing structures or assets such as open space. Roads can also built above existing roads or underground. The Eastern Distributor in Sydney, for example, combined all these techniques. These increases in supply can be very expensive, costing billions of dollars per kilometre. Local government typically has minimal capacity to significantly increase the physical width of roads.

Local governments can increase supply by removing permission for kerbside parking. This supply side measure is a difficult strategy for local government as the beneficiary (the person in motion) is probably not a ratepayer unlike the person who wants parking to be available.

Governments therefore tend to focus on boosting road system efficiency. As the City of Sydney notes 'We have limited space on our roads, so we need to use the space as efficiently as possible.'[24]

### Improve efficiency

Traditionally road managers have interpreted road space efficiency as 'vehicle efficiency', which is usually referred to as 'capacity'. After decades of effort it is generally true that there are few opportunities left in high population centres to increase the vehicle capacity of the road system. The returns from 'vehicle efficiency' have reached their limit and have proven to be inadequate to address the problem of congestion caused by population growth.

Attention is now turning to the development of the 'people efficiency' of roads. From a motor vehicle point of view this could be achieved by increasing the vehicle occupancy. High occupancy (HOV) lanes seek to address the low vehicle occupancy for the journey to work, which in NSW is 1.1 people per vehicle.[25] Generally the 'people efficiency' effort is directed towards providing more 'people capacity' on the road through space efficient modes such as public transport, bicycles and pedestrians. To quote the City of Sydney 'The City's road space is limited. Catering for increasing demand by shifting to the most space-efficient modes is vital for the City's future.'[26]

It is difficult for local governments to influence motor vehicle occupancy – high occupancy lanes are not appropriate on local roads. With some exceptions, the provision of public transport is beyond the capacity of local governments in Australia. The City of Sydney is contributing $220m to the Sydney CBD and South East Light Rail project (CSELR).[27] This substantial sum is 10% of the overall project cost.

Local governments are able to facilitate 'people efficiency' by increasing bicycle and pedestrian traffic. In 2014-2015 the City of Sydney planned to spend $28.5m on bicycle facilities.[28]

### Change the level of demand

Price is used to influence journeys by time and place. Tolls – when the price is paid by the user and not reimbursed by the government or workplace – are effective in influencing demand. Time of day charges, for example, apply on the Sydney Harbour Bridge[29]. Ticket price signals are used in Melbourne where public transport 'travel is free using the farecard '*Myki*' on the electrified train network before 7am'.[30] Commuter car parks in certain districts in Sydney, Melbourne and Perth are taxed by the State in order to 'discourage car use…' particularly for commuter travel to transport rich areas.[31] These tools are not likely to be implemented by individual local governments in Australia.

It is however possible for Councils to influence demand through mode shift. Pressure on road space is reduced when people shift from a space inefficient mode to a space efficient mode. Many if not most inner urban Councils run marketing programs that encourage people to shift modes to take pressure off the road space. The Lord Mayor of Melbourne asserts that 'No great city in the world is trying to bring more cars into the city centre!'[32]

This statement is directed at people using cars to get to the CBD. A bigger problem is the residents' cars that also contribute to the congestion on roads in that municipality whether they are being used for an internal or outgoing journeys.

Car share services are a proven means of generating and supporting significant mode shift. Unlike marketing programs the impact or return on effort is directly measurable. Unlike other supply and demand measures it requires no capital from local government. Unlike the removal of kerbside parking it requires only a small proportion of the kerbside space – less than 5% – to be set aside.

The opportunities available to governments in Australia to address congestion by modifying supply of and demand for road space is described in Table 1 below.

TABLE 1: SUPPLY AND DEMAND OPPORTUNITIES FOR ROAD SPACE

| | INCREASE ROAD SPACE | INCREASE PEOPLE EFFICIENCY | REDUCE OR SHIFT DEMAND |
|---|---|---|---|
| Commonwealth Government | Road deck above or tunnel below | Fund specific programs | Taxes |
| State Governments | Reallocate space to provide more lanes<br>Widen road<br>Road deck above<br>Road tunnel below | Dedicate space to public transport, bicycles and pedestrians | Taxes<br>Tolls<br>Off peak public transport fares |
| **Local Governments** | **Remove kerbside parking** | **Dedicate space to public transport, bicycles and pedestrians** | **Mode shift through marketing and support for car share services** |

*Source:* *PBA*

## 3.2. LOWER USE – BETTER HEALTH AND OTHER BENEFITS

As car share users reduce their VKT they become healthier. They also produce less negative externalities including air pollution[1]. It has been estimated that in 2000, air pollution from motor vehicles was responsible for 1,420 deaths across Australia.[33]. Speaking about the bicycle network envisioned for the City of Sydney, the Lord Mayor acknowledged

> *'the network will cut vehicle congestion, reduce public transport overcrowding, improve health and reduce obesity levels, and decrease pollution and greenhouse gas emissions.'*[34]

The car share network will have a similar impact through the mode shift it generates. Indeed car share networks are shown to be a complimentary mode to active and public transport as the existence of the car share network enables (and encourages) residents to convert many more of their trips to these more efficient modes.

The City of Sydney car sharing policy includes an explicit objective to reduce vehicle emissions:

> *'Car share vehicles are typically much newer and more fuel-efficient than the average vehicle. They emit fewer greenhouse gases and fewer urban air pollutants such as carbon monoxide and nitrogen oxides. In addition to driving less overall, a car share driver will consequently produce fewer emissions per kilometre than the average private driver. Increased uptake of car sharing will contribute to the realisation of the City's target of reducing greenhouse emissions by 70% by 2030.'*

These statements still leave some of the benefits of reduced VKT unrecognised. Research shows that lower VKT is associated with a wide range of benefits for the local community including:

- Fewer casualty accidents. Resulting in lower health care costs and higher productivity
- Lower levels of pollution, particularly the types that directly damage physical health through conditions such as asthma
- Lower levels pollution that directly affects the city environment through effects such as the urban heat island (low-level ozone) and climate change (carbon and sulphur oxides)
- Lower levels of disease caused by sedentary behaviour. Some research shows that on average each car share user walks or cycles for an additional 10 minutes each day. This increase in physical activity results in health benefits to the user and societal benefits from reduced health care and increased productivity of the workforce. However, Sydney specific research of car share users was inconclusive with regard to how members changed their mode choice (with regard to active transport). These health benefits have therefore not been included in the economic model
- Less damage to the public realm. Every kilometre travelled in a car has an impact on the public realm in terms of creating urban barriers (such as multi-lane roads), loss of habitat (trees and vegetation links), soil, water and landscape degradation. The rate of impact is around one cent for each vehicle kilometre and the cumulative impact is borne by the community as a whole.

These values have been estimated in financial terms through research:

- The values for the economic dis-benefit related to 'road safety' and 'damage to the public realm' have been published in the Australian and New Zealand guidelines for transport system management
- The pollution impacts have been published in AustRoads Technical Report AP-T285-14: Updating Environmental Externalities Unit Values 2014

[1] *The World Health Organisation has identified as the world's largest single environmental health risk*

- The physical activity benefits have been published in *Walking, Riding and Public Transport*, Department of Infrastructure and Transport Australian Government 2013.

## 3.3. LOWER USE – LOWER KERBSIDE PARKING DEMAND

Use of car share services reduces on-street short term parking demand. Reduction in this demand opens up a number of valuable opportunities for local governments. The benefit can be taken as reduced demand for parking, although there are two other options: increased mobility and non-transport related uses.

### Mobility value of lower parking demand

Kerbside parking can be replaced with network performance enhancements for:

- Motor vehicles (clearways)
- Public transport (tram and bus lanes, accessible tram stops)
- Bicycle riding (separated bike lanes)
- Walking (wider footpaths, kerb outstands and pedestrian crossings).

For example a significant number of kerbside parking spaces – possibly 750[35] – are being removed to provide space for the movement and platforms for the Sydney CBD and South East Light Rail project. It has been claimed that more than 600 parking spaces have been replaced by the City of Sydney's bicycle network.[36]

In Victoria the motoring organisation, the RACV, has supported the removal of kerbside parking in the CBD to enhance mobility.[37] The City of Melbourne Parking Strategy suggests that in the CBD around 30% of the 3,000 on-street car parking spaces will need to be removed as activity within the CBD intensifies.

The value derived from this repurposing of space could be calculated, but the value of each car space would be very specifically related to its location and the new purpose. Therefore generalised metrics are not available.

## 3.4. LOWER USE – POTENTIAL DISBENEFITS

It is certain that one impact of increased car share use will be increased use of public transport. It has been suggested, however, that if this mode shift occurred in times and places where the public transport system were above desired occupancy levels, the increased patronage would generate a dis-benefit.

Such a dis-benefit would be hard to calculate, as the marginal cost of crowding on public transport is 'unknown'. Nor would it be easy to identify the car share user trips that occurred on crowded public transport. Some of the additional public transport trips generated by car share would be on uncrowded public transport vehicles in the peak (counter peak for example) or during the off peak. Aside from the benefit of increased fare revenue, these trips in times of low occupancy would generate an equally difficult to measure safety benefit of 'surveillance'. For this reason this possible dis-benefit has been excluded from the model.

## 3.5. POTENTIAL FOR INCREASED USE

Some people who do not own a car (for financial or other reasons) may increase their VKT when they start using car share services. For these people and the economy there is a benefit of increased accessibility and participation. This 'social inclusion' benefit is difficult to determine

both in terms of the benefit to individuals and the number of individuals in that position. Therefore these benefits have been excluded from the model.

## 3.6. LOWER USE – SUMMARY OF BENEFITS

The benefits from lower VKT as a result of car share are summarised in Table 2 below.

TABLE 2: SUMMARY OF BENEFITS OF LOWER LEVELS OF CAR USE

| BENEFITS FROM REDUCED USE | MEASURE | GENERALISED VALUE AVAILABLE |
|---|---|---|
| Reduced congestion through mode shift | VKT | Yes |
| Reduced road trauma | VKT | Yes |
| Less pollution | VKT | Yes |
| Increased physical activity | Minutes of physical activity | Yes |
| Less damage to the public realm | VKT | Yes |
| Mobility benefits of reduced parking demand | Number of motor vehicles per hour<br>Numbers of passengers, riders or pedestrians<br>Public transport: minutes of delay, Unreliability (travel time variance) | No |
| Economic, social and sustainability benefits of reduced parking demand | Turnover, number of people, street temperature, drain capacity. | No |

*Source* *PBA Analysis*

# 4. Valuing lower car ownership levels

Perhaps the most significant contribution car share services provide to local governments is through a reduction in car ownership.

Reduced ownership delivers two streams of benefits:

- Household savings
- Less storage space taken up by cars.

## 4.1. LOWER OWNERSHIP – HOUSEHOLD SAVINGS

The household savings from car ownership means that:

- Households have lower transport costs (direct financial impact on households)
- More money is retained in the local economy (multiplier impact of the household finance retained).

Users of car share services tend to have a lower cost of transport in their household budget.

- Those who own a car and sell it – before or after joining a service:
  - Convert the remaining value in the asset into cash
  - Halt their continuing depreciation loss (or interest payments)
  - Avoid paying for most of the standing costs such as registration and insurance
  - Pay for running costs as they go (only paying in direct proportion to their use of the car share vehicle)
  - Increase spending on taxis, bicycles and public transport
  - Reduce costs for parking, tolls and fines as they reduce their VKT.

The amounts vary based on personal circumstances, but many households find themselves with a 'transport surplus' of $5,000 per annum. It is not unusual for car share users to consciously reallocate money in their conceptual household budget. 'The money I saved thanks to car share gave me my first investment property deposit' reported one Melbourne user. This choice is illustrated in Figure 2 below – buy a car for $20,000 or put down a deposit on an apartment.

FIGURE 2: $20,000 CAR OR A $20,000 DEPOSIT


*Source:* *PBA*

There have been a number of studies related to the expenditure of people who get to retail stores on foot or by bike. The rule of thumb appears to be that they offer higher value than car drivers overall by spending less per visit but shopping more frequently.

Efforts have been made in Portland to calculate the economic multiplier of savings on the household transport budget – referred to as the 'green dividend'[38]. Research suggests that up to 80% of this ' transport budget surplus' is likely to be spent in the local economy as people with low motor vehicle use are less likely to drive to where they spend their money and more likely to shop locally.

This 'marginal propensity to consume' locally will vary by person. Some people will not spend the 'surplus', perhaps preferring to retire debt or save up for a longer-term goal such as a holiday or investment. In all cases, some element of the money saved returns to the local economy. If the average marginal propensity to consume is 80%, then an economic multiplier of 5 can be expected.

## 4.2. LOWER OWNERSHIP – LESS STORAGE

For some car owners, the most significant car-related cost is that of the car storage. Each car space in a multi-storey car park costs from $30,000 to $70,000 to construct and spaces in new apartments can cost $50,000 to $140,000 to buy.[39] The capital commitment and debt servicing that is avoided is another financial benefit that accrues to the share car user. A purchaser who can avoid buying a $50,000 car park might be able to save three times that amount in interest payments on their mortgage.[40] In this way transport costs have a direct impact on inner city housing affordability and disposable 'income'.

### Parking and storage

Motoring organisations such as the RACV base their cost-of-motoring estimates on an annual average VKT of 15,000 km.[41] A car that travels this distance in a year at an average of 40km/h will be travelling for 375 hours or around one hour a day. The time that each car is parked constitutes about 85% of its life.

It is useful to differentiate between shorter-term 'parking' and car storage.

Parking space can be understood as space at a destination that over a day is shared by a number of people who use it at various times. Successful parking management maximises the value from this shared space by maximising turnover – the number of people who have used the space. The usual measure is 'occupancy', which measures whether a space is available for a new user.[42]

It is useful to consider the difference between parking and storage, and the duration of time that differentiates one from the other. If the return travel time to the destination is half the waiting time (or less) that dwell time can be called parking or "*short-term parking*". If the waiting time is more than twice the travel time then the stationary time can be defined as storage. The equation for this is shown below:

Short-term parking threshold = Average IVTT x 2

Where:

- IVTT = In-vehicle Travel Time (total of both directions)
- Maximum Short-term parking threshold is 4 hours.

Thus a shopping trip by car with a sixty-minute return journey and two stationary hours at the destination would be parking but between two three-hour commutes on a workday the car would be stored. The time the vehicle spends at home base is storage.

Storage space can be understood as space that is used by one person for a day or a night or even longer. Sometimes storage has economic and social value. When a car is stored at a workplace car park or airport it has contributed to the value that the user will get or provide at their destination. This type of storage has a value and is often managed by price.

Storage at the home base, however adds no value as no value-generating trip is underway. If the vehicle owner is away from home (at work for example) but leaves a car stored at the home base, then the value is negative as even the potential value of a trip is removed. This is one reason why people will pay for airport storage but are reluctant to pay to store a vehicle in their street.

This neutral or negative value is not a problem in low-density suburbs where the low value activity can take place on private land. But it is a problem in higher density areas where home-based car storage typically occurs on the kerbside of local streets. The low value of vehicle storage becomes even more significant if it occurs in a structure or building.

## The contribution of car share

The long periods of storage that are characteristic of the private car provide the foundation of the car share service. People can borrow the car during what to others in the membership group is storage time without mutual inconvenience, just as an unused bedroom can be rented to others on AirBNB. [43]

When a vehicle is shared the storage problem is significantly reduced.

In an effective car share network (one where the members and vehicles are optimally distributed), each car in the network will replace (or avoid) ten stored motor vehicles. Stored cars take up a lot of space[44]:

- In buildings, they occupy a 75 cubic metre 'room' with a footprint of 30m$^2$. This rule of thumb takes account of the access driveways, ramps and corridors that enable the vehicle to get to the car park and car user to get to the car park.
- Outside, one car occupies a footprint of 15m$^2$ usually of kerbside space.

One positive impact from a car share network of 100 cars is the release 30,000 m$^2$ of net floor area in a building or 15,000 m$^2$ of kerbside space. Such kerbside space would stretch for at least five kilometres – the distance from Circular Quay to Central Station and back.

The value of this space can be estimated by considering storage space from a number of perspectives:

- The cost of building structures to store home based vehicles
- The value released from not having to store vehicles in structures
- The value released from not having to store vehicles at the kerb.

## Reducing the cost of structures

When car storage is avoided, then the costs of a structure that relate to vehicle storage can be avoided including:

- Purchase of the land
- Any excavation and remediation if the soil is contaminated

- Construction and maintenance
- Loan fees and legal costs
- Management and fee collection.

Many of these costs will vary from site to site and will depend on scale, but it is possible to get an appreciation of the cost of providing parking by using construction costs, which are well documented and similar in across Australia. These range from $10,000 - $60,000 per car space. Surfacing land and installing kerb and channel for a car space will cost upwards of $10,000 while car parking structures underground or above ground level will cost up to $60,000 a space.

The City of Bremen, for example, uses the avoided cost of car storage structures to understand the value of its car share network. For example, a car share network with 100 vehicles could save in the order of $50 million in building costs (for the car storage structure) and release land and capital for higher value uses.

## Increasing the value of structures

Rising land values are forcing building developers and owners to increase the return from buildings. This process has exposed car storage as one of the lower values in a structure.

The Colliers 2015 Parking White Paper says 'The supply of commercial car spaces across Australian CBDs is very limited. Fewer parking bays are being developed within new office and residential buildings, and no new stand-alone car parking stations are currently proposed. In fact, we are seeing the demolition of several existing car parking stations to make-way for apartment and office developments.'[45]

### Demolition

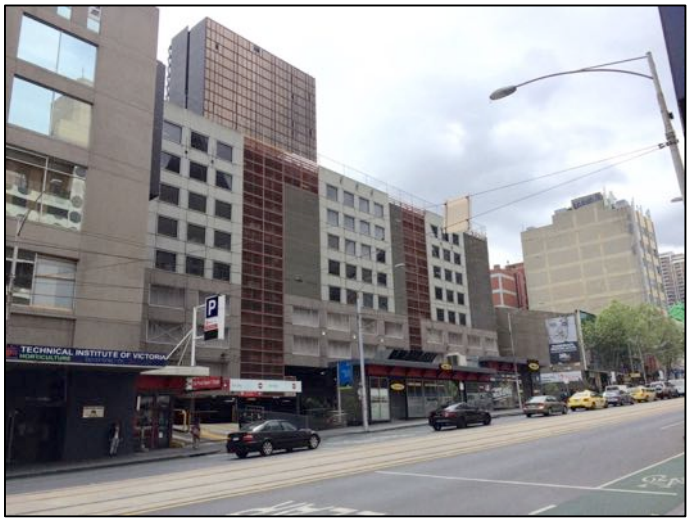
Figure 3 shows a typical example of this trend at 12 Queens Road in the City of Port Phillip in Melbourne where a seven-storey car park will be replaced with 20 levels of residential apartments. 'The basement will provide 104 bicycle bays and 260 car parking spaces (below the statutory 331 required).'[46]

FIGURE 3: CAR PARK AT 12 QUEENS ROAD

*Source:* *PBA*

Figure 4 shows a nine-story car park with 689 spaces at 224-252 La Trobe Street, Melbourne. This is soon to be replaced with a 78-storey apartment building with 1,343 dwellings.

FIGURE 4: CAR PARK AT 224-252 LA TROBE STREET




*Source: PBA*

### Less vehicle storage in new buildings

Car parking in basements is being avoided by developers, purchasers and building owners. Breathe Architects report that they were able to avoid paying $750,000 to construct a parking basement by selling two-bedroom apartments without any car parking (see Figure 29 below). They report that this reduced the cost of each apartment by $30,000.

Many municipal urban planning policies support a reduction in car storage in new and change-of-use buildings. In 2012 the City of Sydney removed minimum requirements for new apartments. Car storage requirements will be reduced in 22 NSW Councils for projects approved after July 2015. The new rules will remove or reduce car storage requirements, allow separate titles for car parks and allow for car share allocation in parking areas. Similar reductions in car storage requirements have been in place in the City of Melbourne since 2010.[47]

In addition State government car park levies in Sydney, Melbourne and Perth have raised the cost of supplying long-term car parking and suppressed the use of parking in locations where the levy applies. (Unfortunately, the NSW Parking Space Levy also has the function of suppressing car share usage as in that State the Levy is applied to car share vehicles).

### Repurposing existing vehicle storage

Where car park spaces exist, they are being repurposed. An apartment with a footprint the size of two car spaces – around 60m$^2$ – can be sold for five times the price of two car spaces in the same building. Recently eight apartments replaced a floor of car parking on the eighth floor of the QV centre in Melbourne.

Figure 5 shows a street level carpark in the Melbourne CBD that has been replaced by a retail store.

FIGURE 5: RETAIL IS A HIGHER VALUE USE THAN GROUND FLOOR PARKING, BOURKE STREET MELBOURNE


*Photo: PBA*

## These reductions in cost and increases in value have a positive impact on the local economy. Other economic benefits can also be identified:

- Buildings with less vehicle storage can be smaller (or fit more uses in the same space).
- Buildings can be more active. For example, areas set aside for workplace parking are inactive during nights and weekends. Figure 6 below shows a street level workplace car park out of working hours
- Car spaces in buildings can generate losses in the surrounding area. The City of Melbourne Southbank Structure Plan says that buildings with parking podiums create:

> *'a dead and intimidating public realm lacking in activity and natural surveillance. This inactivity reduces the security, vibrancy and attractiveness of the street and makes Southbank a poor walking environment and a cold and unfriendly place.'*

FIGURE 6: DAYTIME WORKPLACE STORAGE CANNOT BE USED BY OTHERS AT NIGHT OR ON WEEKENDS

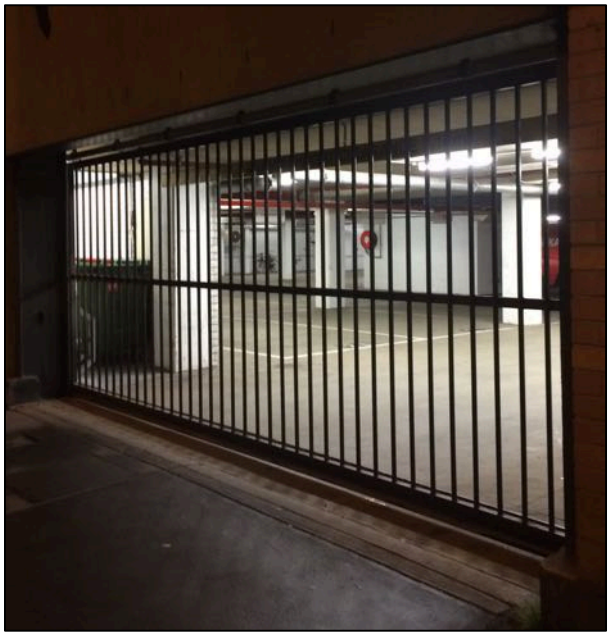


*Photo: PBA*

There are potential benefits to individuals as well.

Housing costs can be reduced if residential buildings do not include vehicle storage or when residents can choose apartments without car parks. On the other hand requiring car parks in areas where car ownership can be avoided burdens the renter or owner with additional costs.

Interestingly people making the transition to inner city living can make purchasing choices that are to their longer-term disadvantage. A developer reported that one of their buildings had transitioned from having 'not enough' car parks in the period when people first moved in to having 'too many' over a period of eighteen months.[48] These empty spaces behind the security door, unneeded by the owners and unavailable to other users, are stranded assets (unless the possibility of reuse has been allowed for in the design).

## Less vehicle storage kerbside

The other space in which vehicles are stored is at the kerb where the Council is both the owner and manager of the space on behalf of the community.

When kerbside storage is avoided, then the competition for the space can be reduced and other parking uses supported. Benefit can also be gained by putting the kerbside space to a higher value use.

## Less competition for kerbside space

Kerbside space in Australian municipalities is mainly used for home base car storage. This is not a problem in outer areas where in general the supply of space is greater than the number of vehicles and where residential uses are separate from commercial or retail areas. However in inner areas the supply of kerbside space is contested and many uses are competing to use the limited space for storage and parking.

Residents want storage expecting to be able to use the kerb for convenient storage of all the cars owned by the household as well as parking the cars of people coming to visit them. Retailers and small businesses expect the kerb to be set aside for parking to load, unload and attract clients and customers. They also want storage for staff and company vehicles. These expectations are set out in Table 3 below.

TABLE 3: KERBSIDE SPACE EXPECTATIONS

| | RESIDENTS | RETAIL, COMMERCIAL |
|---|---|---|
| **Storage** | Home based vehicles | Staff, company vehicles |
| **Parking** | Visitors | Customers, clients, deliveries/pick ups |

*Source: PBA*

To reduce competition most inner city Councils have cut access to the kerb for people moving into the municipality. Residents of multi-unit properties have been unable to get a kerbside-parking permit in some areas of the City of Sydney since 1996.

Aside from these bans, once they have set aside space for multi-use purposes uses such as hydrants and bus stops, Councils will let the remaining kerbside space be used on a first-come-first served basis to all users and for all purposes. Figure 7 shows 50m of unregulated space in Surry Hills in the City of Sydney.

FIGURE 7: UNCONTROLLED SPACE

*Photo: PBA*

Councils are usually reluctant to manage kerbside storage for existing residents. Incumbent residents not only get a kerbside permit storage for one car available on their land the access to this storage also takes up kerbside space. Figure 8 shows the chevron area set aside to allow residents to reach their storage area.

FIGURE 8: KERBSIDE USE BY PRIVATE USERS (SURRY HILLS SYDNEY)

*Source:* *Photo PBA*

Kerbside storage is also used for trailers, boats, caravans and un-roadworthy vehicles. Figure 9 below shows a boat in Surry Hills Sydney, a caravan in Westgarth Melbourne and un-roadworthy cars in Parkville Melbourne.

FIGURE 9: KERBSIDE STORAGE OF EQUIPMENT

*Photo:* *PBA Photo archive*

Local businesses also explore the boundaries of the parking management system. Figure 10 below shows a vehicle in Surry Hills, Sydney which has a valid registration and resident permit but judging by the debris underneath the vehicle and the items in the front seats it has not moved for a long time and is being used as a shed by a nearby retail outlet.

FIGURE 10: INDEFINITE PERIOD OF STORAGE


*Photo:* *PBA Photo archive*

As pressure on the kerbside supply rises, the available kerbside space is often restricted to local residents who compete between themselves on a first come first served basis. Typically, Councils issue access permits by the household and do not link either the household need or the number of cars to the width of the property or to the available space. A 5m wide property might hold 20m of kerbside parking permission: three car parking permits and a visitor permit. During this phase Councils will often issue more permits than the available kerbside space.

When pressure on the available supply rises further, Councils typically limit the permits per household. In some areas only one kerbside permit is available to each household. The City of Sydney has recently brought in a permit of one car per household for Area 19 (Kings Cross). Even when the pressure is at this level, the Councils still do not link permits to available space, by for example issuing 'second permits' only if there is still unclaimed space after first permits have been issued.

In some locations Councils will try to get more value out of the kerbside space by simultaneously allowing parking and storage in the same location. This is only effective if the residents move their stored vehicles away from the kerb by, for example, driving to work. In these situations a low use private vehicle stored at home base is not only doing nothing but is also stopping the space being used for other purposes.

The opportunity to reduce competition for limited kerbside space through voluntary enrolment in car share is significant.

There is an opportunity to use the service to reduce pressure on kerbside space at any stage. Car share enrolments can postpone the need for resident permits or the need to restrict permits. Neighbourhood recruitment of users would enable those who wanted to retain ownership and the convenience of kerbside parking to do so for longer.

The benefits would be felt inside the Council and could be measured as time saved for Councillors and officers. Changes in customer satisfaction ratings could be valued – parking is the third highest reason for complaint including the difficulty of 'parking in my street'.[49]

The current techniques used to manage competition for kerbside space and the relevance of car share are shown Table 4 below.

TABLE 4: KERBSIDE SPACE MANAGEMENT

| | RESIDENTS | RETAIL, COMMERCIAL |
|---|---|---|
| **Storage** | No access for residents of apartments<br>Resident permits<br>Resident permit limits<br>Increase use of car share | Business permits<br>Increase use of car share |
| **Parking** | Visitor permits | Time, Payment |

*Source: PBA*

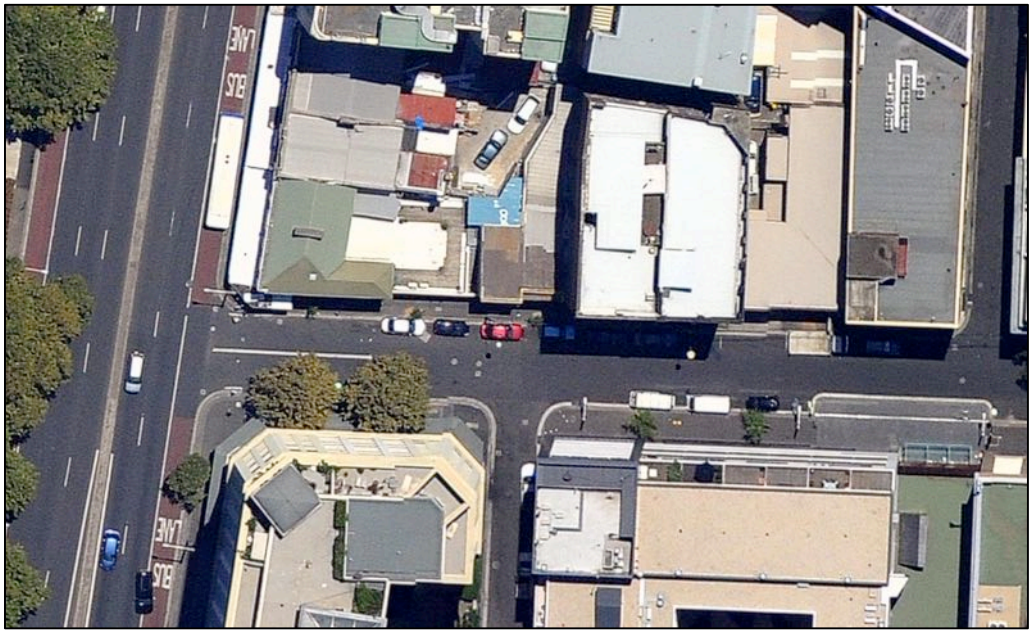
## The value of 'more vital' uses of kerbside space

There are other valuable uses of kerbside space that local governments are elevating above kerbside parking. The submissions report on the CSELR March 2014 notes the 'General acknowledgement of the need to progressively reallocate road space from car parking to other more vital uses, such as facilities for walking, cycling and using public transport, street gardens and appealing public space.' Other uses in this category include bicycle parking and outdoor dining. The transport related values that can be derived by repurposing 'parking' were discussed above. There are also non-transport related benefits that can be derived from reducing kerbside car storage and repurposing the space.

These 'more vital uses' can be combined. An example of such an approach can be seen in Reservoir Street, Surry Hills. Figure 11 and Figure 12 below shows that over a period of four years:

- Kerbs have been extended to provide 'appealing public space',
- Pedestrian priority has been established and the crossing distance reduced
- A storm water swale has been established
- Plantings irrigated by storm water have been established
- A car share bay has been defined.

FIGURE 11: RESERVOIR STREET, SURRY HILLS, SYDNEY 2010



*Source: NearMap January 2010*

FIGURE 12: RESERVOIR STREET, SURRY HILLS, SYDNEY 2014

*Source: NearMap July 2014*

The public realm improvements (vegetation and outdoor dining) are shown to the left of the car share vehicle in Figure 13 below.

FIGURE 13: RESERVOIR STREET, SURRY HILLS, SYDNEY 2015 LOOKING WEST


*Source:* *PBA*

The value derived from this repurposing of space includes:

- Economic activity including residential, commercial or retail activities
- Social capital through non-commercial 'people activity'
- Sustainability benefits including shade from tree canopies and water sensitive urban design.

It is possible to gather data that indicates the performance of these alternative uses of kerbside space. Economic activity can be measured through intercept surveys or derived from café chair permit numbers. People activity can be measured in a number of ways including through camera observation or mobile phone tracking. Street temperatures can be tracked as well as stormwater drain capacity.

# 5. Economic value – the model

This section provides an overview of the benefit and cost model:

- Describing the elements that have been identified
- Indicating which ones have been available for the model
- Identifying the unit values that have been used to calculate economic benefits and costs
- Noting the elements that have not been included in the model.

The economic and financial impacts have been categorised based on the broad 'trigger' for each type of impact including:

- Use of private vehicles
- Ownership of private vehicles
- Storage of private vehicles
- Mode management and administration
- Infrastructure and maintenance
- Opportunity costs associated with the use of space.

These broadly replicate some of the information in previous chapters, however they need to be discussed in context of how they can be modelled. Each of the elements are discussed first in terms of benefits and then in terms of costs with a note about whether or not they can be included in the model.

The inputs to the economic model are sufficiently robust to inform policy. However, the following characteristics need to be taken into account:

- The benefits are based on conservative estimates to avoid potential for optimism bias
- Significant benefits have been excluded from the model in particular the opportunity value of space in buildings
- The data from the car share users is self-reported.[50]

The detailed calculation with references to the measures and ratios used is set out in *Appendix A: Detailed calculations for the economic assessment.*

## 5.1. BENEFITS FROM REDUCED USE

The economic impact of reduced car use can be calculated based on the change in vehicle kilometres travelled by those that become members. The other economic impact is on physical health that occurs when people change the amount of physical exercise they undertake as part of their daily travel needs.

### Reduced Vehicle kilometres travelled (VKT)

A number of benefits are generated when the switch from car ownership to car share use reduces VKT. These benefits are listed in Table 5 below.

TABLE 5: VALUE OF REDUCED VKT

| BENEFITS FROM REDUCED USE OF MOTOR VEHICLES | LINK TO VKT |
|---|---|
| **Reduced congestion** | When VKT is reduced, congestion is reduced |
| **Reduced road trauma** | When VKT is reduced there are fewer crashes and road trauma is reduced |
| **Reduced damage to pubic health from air pollution** | When VKT is reduced, there is less health damaging pollution such as diesel particulates and nitrous oxide |
| **Reduced noise** | When VKT is reduced, there is less noise pollution |
| **Reduced $CO^2$ emissions** | When VKT is reduced, there is less $CO^2$ emitted |
| **Reduced damage to natural and urban environment** | When VKT is reduced, there is less damage to soil, water and biodiversity, nature, landscape and fewer urban barriers. |

*For more detail see Appendix A: Detailed calculations for the economic assessment*

The model assumes that each car share user reduces their VKT by 1,947 km each year. This assumption is based analysis of City of Sydney residents responding to the GoGet 2015 user survey.

### Value

The economic value of the difference in VKT is calculated using values determined through research and published in:

- Austroads Technical Report AP-T285-14: Updating Environmental Externalities Unit Values 2014
- Australian Guidelines for Transport System Management
- Australian Road Research Board 2007, Road Safety Risk Reporter Issue 7 Crash Cost Rate for Urban Roads
- *Walking, Riding and Public Transport*, Department of Infrastructure and Transport Australian Government 2013.

Table 6 shows the unit values based on VKT that have been used in the model.

TABLE 6: SUMMARY OF BENEFITS AND VALUES RELATED TO LOWER VKT

| BENEFITS FROM REDUCED USE OF MOTOR VEHICLES | UNIT RATE / AVOIDED VEHICLE KILOMETRES TRAVELLED (VKT) EACH YEAR |
|---|---|
| **Reduced congestion** | **$0.2249** |
| **Reduced road trauma** | **$0.0485** |
| **Reduced damage to pubic health from air pollution** | **$0.0124** |
| **Value of reduced noise** | **$0.0030** |
| **Value of reduced $CO_2$ emissions** | **$0.0066** |
| **Reduced damage to natural and urban environment** | **$0.0116** |

*Notes: See Appendix A: Detailed calculations for the economic assessment*

## Additional physical activity

In recent years the cost of a sedentary lifestyle and the value of increasing the number of minutes of physical activity people put together have become apparent. A recent study suggested that increases in physical activity could account for up to 70% of the cost of a walking project (see below). If it could be shown that car share use increased physical activity, that would be a powerful argument in favour of the service.

On balance it has been decided that benefits relating to physical activity should be excluded from the model even though a reliable rate to calculate the benefits exists. This is because, although we know that that increased physical activity is correlated with increased walking, public transport or bicycle trips, we do not know how these are correlated with car share membership. There is a lack of robust research that highlights the change in physical activity resulting from car share membership.

There have been a number of attempts to monetise the value of additional minutes including:

- Trubka, Newman and Billsborough (2009). The rate for walking in this assessment is $3.02 per hour. (Assuming the walker travelled at 5kph the rate would be 60 cents a kilometre)
- Queensland Department of Transport and Main Roads *Benefits of inclusion of active transport in infrastructure projects* SKM and PWC (2011).

The latter document notes: 'A typical cost benefit analysis for an active transport project shows that public health accounts for most of the economic benefits, even after adjusting for injury costs. The net health benefit (adjusted for injury) for each kilometre walked is 144 cents – about 70 per cent of the total economic benefits of a walking project. The net health benefit (adjusted for injury) for each kilometre cycled is 74 cents – about half of the total economic benefits of a bikeway project.'

The second half of an economic assessment is the factor – the number of minutes or kilometres that are completed using an active mode such as walking (including walking to public transport) or bicycle riding. Value is derived from an increase in minutes or kilometres of additional walking or bicycle riding that has (or will) take place.

There have been a number of attempts to understand the ways in which people change their travel behaviours when they join a car share service. There is good evidence that people who belong to a car share service use cars less than before but their new transport choices are less well understood.

There are sub groups of car share users who might reduce their level of physical activity – for example those who are unable to afford to own a car but thanks to the service can afford short-term rental.

There are also sub groups of car share users who neither use cars more or less as a result of membership, for example those who use the service to 'top up' their current level of ownership or those who use drop ownership but join the service and take up the use of taxis.

The most likely group to change their behaviour in a way that increases the level of physical activity are those who reduce their level of ownership, particularly those who reduce their ownership to zero. But, since these will be people who dispose of a car that are not using very much, they might not change their travel behaviour in any significant way.

Most of the assessments of changed behaviour have used self-reported surveys of car share users. The 2011 survey of GoGet users reported in the SGS report found that 75% of respondents

reported that they had not changed their level of cycling or walking activity. A similar survey of GoGet users in 2015 found that:

- 81% of users reported no change in their level of walking
- 94% reported no change in the level of bicycle riding.
- 81% reported no change in the level of public transport use

Some of the respondents to both surveys reported increases and decreases in the level of active modes.

These results are not statistically reliable, as respondents have been proven to be poor judges of their own behaviour change (particularly with regard to what their previous behaviour was). This 'forgetting' was demonstrated by research during the Stockholm congestion charging trial in 2006 reported in The Stockholm Congestion Charges, Eliasson Centre for Transport Studies KTH Royal Institute of Technology 2014. Studies demonstrated that drivers were unaware of 75% of the change in trips that had been observed after the implementation of the congestion charge. It also showed that even though 29% had changed their view from opposition to support of the congestion charge only 13% reported that they had become 'more positive' about the initiative.

Until self-reported data can be compared to direct observation (as occurred in Stockholm), it will not be possible to arrive at a reliable 'factor' to use with the 'rate'.

Some studies have asked respondents to assess the proportionate increase in their use of alternative modes – a difficult task to perform accurately if your life depended on it! The responses are interesting and reflect a perception among the users that they are using the mode more. But it is not appropriate to use this as a factor.

A better comparison would be between people living in the same neighbourhood with similar family and work circumstances. A comparison of travel behaviour between those without a car, those without a private car but using car share and those with a private car would be revealing. Again for residents of a dense urban area where car share services are likely to be available, the difference will be at the margins. It is likely in Manhattan or London that each cohort would tend to use public transport to get to work, for example.

### Value

If the number of additional minutes walked and cycled can be determined, then the economic value of the 'additional minutes' can be calculated. These values, shown in Table 7 have been estimated in financial terms and published in *Walking, Riding and Public Transport, Department of Infrastructure and Transport Australian Government 2013*.

TABLE 7: SUMMARY OF PUBLIC HEALTH BENEFITS

| BENEFIT FROM MODE SHIFT TO ACTIVE MODES | UNIT RATE /HOUR |
|---|---|
| **Health benefit – increased physical activity** | **$7.61 / hour walked**<br>**$11.89 / hour cycled** |

*Note:* *See Appendix A: Detailed calculations for the economic assessment*

## Benefits related to reduced use not included in the model

The model does not include a number of benefits that derive from the reduction in car use that occurs when there is a switch from car ownership to car share use including:

- An 'access benefit' of reduced short term parking demand: When car usage is reduced, short term parking demand is reduced and as a result occupancy may be reduced. In San Francisco improved car park occupancy has been associated with an increase in local sales tax, which is a measure of retail revenue.[51]
- A 'mobility benefit' related to the value to public transport, bicycling and walking of repurposed kerbside space. This space can be repurposed for exclusive lanes (public transport and bicycles), platform or kerb outstand stops to allow faster loading and unloading (public transport) or wider footpaths for pedestrians.

While there are measures that could be used to understand the scale of change, the unit rates would be difficult to quantify, as the values would be specific to each circumstance.

The benefits that derive from lower use of cars (as a result of car share) are summarised in Table 8 below. However, none of these has been included in the model as the value is undefined.

TABLE 8: SUMMARY OF BENEFITS OF ADDITIONAL BENEFITS LOWER LEVELS OF CAR USE

| BENEFITS FROM REDUCED USE OF MOTOR VEHICLES | POSSIBLE MEASURES | UNIT RATE /REPURPOSED METRE OF KERBSIDE SPACE |
|---|---|---|
| Access benefits of reduced short term parking demand | Occupancy rate of car parks<br>Retail turnover | Not available |
| Value to public transport of kerbside space repurposed as, for example, exclusive lanes or platform stops | Reduction in lost passenger minutes<br>Increase in passenger numbers | Not available |
| Value to bicycling or walking of kerbside space repurposed as, for example, exclusive lanes or wider footpaths | Increase in usage<br>Number of diverted and induced trips<br>Additional minutes of physical activity | Not available<br><br>Rate available |

*Source:* *PBA*

# 5.2. FINANCIAL SAVINGS FROM REDUCED CAR OWNERSHIP

A number of financial benefits accrue to a household that switches from car ownership to the use of car share services. These include:

- The value that is gained by selling (or not buying) a car
- A reduction in travel costs
- The savings from not needing to buy or rent a car space.

A summary of the elements included in the model is provided in Table 9 below.

TABLE 9: SUMMARY OF CAR OWNERSHIP REDUCTION VALUES

| TYPE OF VALUE | FACTOR | RATE |
|---|---|---|
| Car ownership savings | 52% of members | $993.66 each year |
| Vehicle use savings | Per VKT | $0.1618 |
| Car storage savings | 30% of members | $4,716 each year |

*Source: PBA Analysis*

## Car ownership costs avoided

The model assumes that the number of cars deferred (sold or avoided) is 52 for each 100 members. This assumption is based analysis of City of Sydney residents responding to the GoGet 2015 user survey.

The model uses the value of not owning a car of $993.66 for all users.

The GoGet 2015 user survey asked the value of vehicles that have sold and the value of vehicles that would be bought if the car share service were withdrawn.

- The average vehicle sale value reported by users was $7,543
- The value of the deferred purchase of vehicles was estimated by the users to be at least $13,000.

The capital or 'resale' value of cars sold has been assumed to be $0 (zero) as it is difficult to determine the capital value of a range of depreciating assets with different purchase prices and care regimes.

Someone who sold a car for $10,000 and used the service would have a benefit that does not appear in the model. Nor would they pay directly for registration and insurance.

This conservative figure is balanced by the inclusion of a value of $993.66 of reduced ownership costs estimated by the Australian Transport Council.

## Avoided household travel expenditure

The GoGet 2015 user survey asked users to estimate the annual travel savings they achieve by using car share. The average of the user estimates is $1,971 each year. This included those who said that they did not save any money.

The model assumes that the travel cost savings can best be understood by using the reduction in VKT each year.

This assumption is based on the assumption that the cost of the VKT the user completes, is the same whether it is completed in a car share vehicle or a private vehicle. In practice the cost of the private vehicle kilometres will be higher as the car share standing and maintenance costs will be spread over more vehicle kilometres. The car share vehicle is also likely to have lower fuel costs as it is likely to be smaller, newer and better maintained.

This approach means the model does not need to account for the costs of the annual VKT that each car share member still completes or the ongoing operational costs of the car share vehicles (both private costs and their impact on the community).

## Avoided car space rental

The model assumes that 30% of car share users have been able to avoid buying an off-street car park. This assumption is based on responses from the GoGet 2015 user survey:

- 52% of users said that they deferred a purchase of a vehicle
- 58% of those who specified where they would have had to park the deferred vehicle indicated that if they purchased a vehicle it would be parked off street.

The model uses the following assumptions to understand the value of this benefit.

The value of a car park is based on the cost of purchasing a car space at market rates in the City of Sydney ($73,000) and paying for it with a typical mortgage (5.0%).

## Benefits of reduced ownership not included in the model

There are some elements of value related to the reduction in stored vehicles that have not been included in the model. These are discussed below.

### Economic multiplier

A significant proportion of the money spent on car ownership and use leaves the local economy. When this type of expenditure is avoided, a proportion of the saving will be spent in the local economy.

Table 10 shows the responses to the GoGet 2015 user survey in which users indicated that 34% of the savings (made by those who reported savings) are redirected to the local economy.

TABLE 10: SUMMARY OF RESPONSES: SPENDING ALLOCATION OF CAR SHARE SAVINGS

| SECTOR | PROPORTION | NOTES |
|---|---|---|
| General household expenses | 18% | Local multiplier |
| Local entertainment | 10% | Local multiplier |
| Holiday in Australia | 6% | Local multiplier |
| | | |
| Bank/mortgage | 32% | Financial resilience |
| | | |
| Holiday overseas | 19% | |
| Other | 18% | |
| No savings | 17% | |

*Source: PBA Analysis GoGet User Survey 2015*

### Reduced competition for kerbside space

There is a value to municipalities and the community when fewer households seek to use kerbside storage spaces. Currently parking is one of the most frequent reasons that residents contact Council and one of the main factors of dissatisfaction with local area management. This value has not been estimated but could be calculated in terms of staff time avoided or in the value of higher customer satisfaction ratings.

There is also a private value that accrues when competition for kerbside parking is reduced. A resident searching for car parking who can find parking spaces more easily saves time and

frustration. The private value of this advantage is difficult to determine and is therefore not included in the economic model. Nor does the model include the value to the community of the kerbside space that is released (or not occupied) when people dispose of (or avoid buying) a private vehicle.

### Reduce car parking space in buildings

The value of improvements (or costs) relating to buildings has been excluded. The values that have been identified include:

- Enabling buildings to positively address the street through activity and natural surveillance including:
    - Car park podiums avoided or reduced
    - Car parks at ground level avoided or reduced
- Reducing the cost of buildings by avoiding or reducing basement size
- Increasing the activity value in buildings by including more high value uses before construction or replacing low use car parks with other uses such as apartments.
- Reducing lost value of workplace and other car parks that are not available to the public and/or at certain times.

## 5.3. BENEFITS FROM LEVIES AND TAXES

The model includes the fees that the City of Sydney charges as a financial benefit of the car share network.

From a policy perspective (as noted elsewhere in this report) any fees levied on car share services could be considered a cost as fees and charges will suppress the use and expansion of the car share network. However when they are levied, they provide Council with a financial benefit. To some extent this benefit is balanced by costs incurred by Councils. These costs and benefits are therefore all included in the model. Table 11 lists the benefits Council receives from levies.

TABLE 11: VALUE OF REVENUE COLLECTED BY LOCAL GOVERNMENT

| ITEM | RATES | PAYABLE |
|---|---|---|
| Mode management fees | $450/vehicle | On installation |
| Installation costs (Signs, pavement paint) | $1,900/vehicle | On installation |
| Resident parking fees | $52 /vehicle p.a. | Annually |
| Reinstatement fee (Remove car share pavement paint and signage) | - | As required |

*Source:* *City of Sydney 2014/15 Budget*

*Note:* *See Appendix A: Detailed calculations for the economic assessment*

## 5.4. COSTS

The introduction and expansion of car share services trigger a number of costs. The model includes the following:

- The opportunity cost of the public space occupied by the car share vehicle
- The cost of supporting infrastructure and maintenance
- The cost to the Council of managing the mode.

### The value of kerbside space occupied by car share vehicles

The model applies a cost to each car share vehicle in the network parked at the kerb. It has been assumed that each car share vehicle parked at the kerb occupies 15m$^2$ of kerbside space.

The model uses the value of $3,981 per car share vehicle deployed based on the rates in Table 12 below.

TABLE 12: VALUE OF 15M$^2$ IN THE CITY OF SYDNEY

| TYPE OF LEASE | ANNUAL LEASE FEES |
|---|---|
| Car park lease | $2,600 - $4,400 |
| Retail, office, commercial lease | $2,400 - $8,000 |

*Source: PBA analysis Market rates City of Sydney October 2015*

### Infrastructure costs

Although no other user of kerbside space is charged for infrastructure as discussed above, the costs do exist and it is appropriate to include them in the economic model. Information on costs comes from the City of Sydney internal budget.

The costs are related to the number of deployed vehicles and are not annualised as there is no defined guaranteed period that the car share service providers have access to the space.

The rates used in the model are shown in Table 13 below.

TABLE 13: COSTS TO LOCAL GOVERNMENT PER VEHICLE DEPLOYED

| ITEM | RATES | PAYABLE |
|---|---|---|
| **Mode management fee** | **$450/vehicle** | **On installation** |
| **Installation cost (Signs, pavement paint)** | **$1,900/vehicle** | **On installation** |
| **Resident parking permit** | **$52 /vehicle p.a.** | **Annually** |
| **Reinstatement fee** (Remove car share pavement paint and signage) | - | As required |

*Source:* *City of Sydney 2014/15 Budget*

*Note:* *See Appendix A: Detailed calculations for the economic assessment*

## Mode management costs

As discussed below a Council that is determined to extract the maximum value from a car share network will have an internal task similar to the development of bicycle transport within the municipality.

This task will vary from Council to Council depending on the size of the service and the level of growth that the municipality wishes to facilitate.

A useful measure is the number of equivalent full time staff members, (recognising that in practice this load might be split across a number of areas of responsibility). At the City of Moreland a budget of $100,000 a year for one full time staff resource to facilitate the expansion of the service by 100 cars in a year was proposed.[52]

The model uses the per vehicle fee charged by the City of Sydney.

## Parking meter revenue excluded

Parking meter revenue is not included in the model because car share vehicles do not tend to affect parking revenue. This is because the installation of car share vehicles does not automatically divert drivers wishing to park on the street into alternative (off-street) parking.

The municipal revenue from on-street parking management is influenced by many factors including the fee rate (which may differ by user or time of day) and the occupancy rate. World's best practice requires the fee rate be linked to the occupancy target that is set (by policy) for each area. This means that the parking fee (typically payable per hour) would vary (up and down) in response to demand. As such, removing a car space for any particular use (such as loading zone, bus bay or car share vehicle) does not necessarily have a significant impact on parking meter revenue and only impacts on it if occupancy is particularly high.

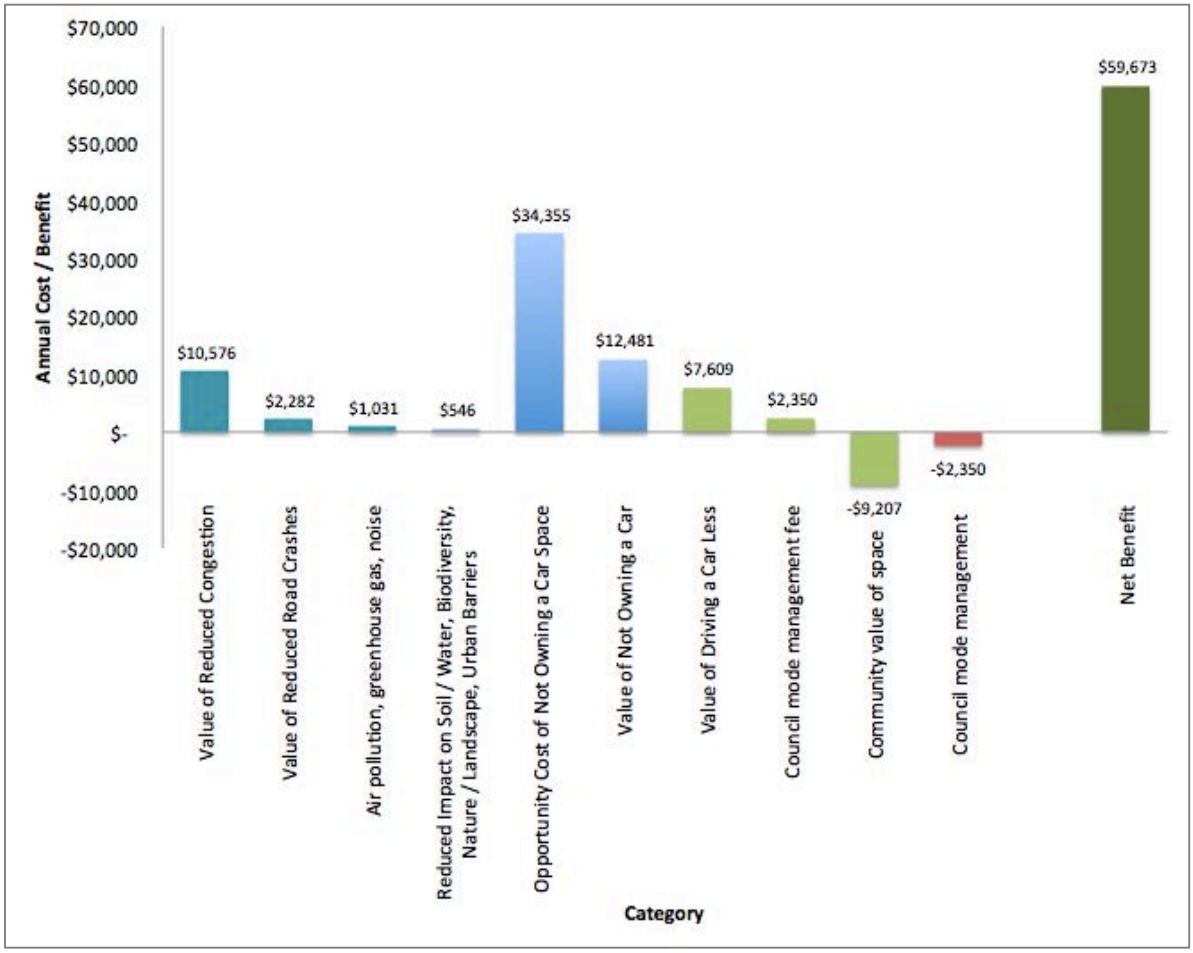
Analysis of parking meter revenue has not been undertaken as part of this study and is therefore not included in the model.

## 5.5. SUMMARY OF ECONOMIC MODEL

The analysis has estimated total benefits and costs to users, the community and the City of Sydney. The estimate has been based on a network of 805 deployed car share vehicles. While it does not provide use total figures for the whole of Australia, as the largest car share fleet in the Country it does provide the best indication of the impact of car share services in urban areas.

The elements of the economic model are shown graphically in Figure 14 and listed in Table 14 below.

FIGURE 14: SUMMARY OF BENEFITS AND COSTS PER CAR SHARE VEHICLE




*Source:* *PBA modelling*

TABLE 14: SUMMARY OF ECONOMIC ANALYSIS

| ELEMENTS OF THE MODEL (PER DEPLOYED VEHICLE) | ECONOMIC VALUE | ECONOMIC COST | TOTALS |
|---|---|---|---|
| Value of Reduced Congestion | $10,576 | | |
| Value of Road Crashes avoided | $2,282 | | |
| Value of air pollution, greenhouse gas, and noise avoided | $1,031 | | |
| Value of reduced Impact on Soil / Water, Biodiversity, Nature / Landscape, Urban Barriers | $546 | | |
| Value of not Owning a Car Space | $34,355 | | |
| Value of Not Owning a Car | $12,481 | | |
| Value of Driving a Car Less | $7,609 | | |
| Council fees | $2,350 | | |
| Community value of kerbside space | | -$9,207 | |
| Council mode management costs | | -$2,350 | |
| Total benefits | | | $71,230 |
| Total costs | | | $11,557 |
| Net benefit | | | $59,673 |
| Benefit cost ratio | | | 6.16 |
| Total value of 2015 network of Sydney's 805 car share vehicles | | | $48 million |

*Source: Phillip Boyle & Associates (PBA) Analysis*

# 6. A value based strategy

The City of Sydney has clearly excelled at providing a rapid expansion of car share services to its community. There is no better example in Australia and the proportion of residents in the City of Sydney who are members is relatively high when compared globally. All municipalities in Australia will need to follow their lead if they want to avoid local congestion and minimise the cost of travel for their residents and businesses. This chapter of the report uses the City of Sydney as a case study but the choice are those that apply equally to every municipality in the country.

There are some impediments that are preventing operators growing quickly, in particular the risk/reward profile that overburdens each new car share vehicle and relies on the private sector taking on a significant risk associated with finding members to utilise the cars enough to make them financially viable.

In order to better meet the transport needs of residents and ratepayers, the City of Sydney should carefully consider the value provided by all transport networks (including the car share network) and plan for a holistic suite of transport improvements that makes the overall network more efficient and economically productive.

This chapter of the report provides a case for Council consideration of a range of 'goals' that are linked to existing higher level strategies. This strategic intent is based on strategies that exist at the City of Sydney, although the principles and strategic intent tends to be replicated in other municipalities across Australia (and the world). The chapter concludes with some remarks about potential scenarios that are likely to come to fruition (dependant on which goals the City adopts).

## 6.1. LINKING STRATEGY TO THE CAR SHARE NETWORK

Municipalities in Australia that have or are developing car share networks tend to be those that are also being stressed by population increases and higher land prices. This is where car share service providers find their services are in most demand, because residents are actively seeking alternatives to reduce the cost of living and reduce the frustration related to searching for a car storage.

The intensification of urban areas creates significant challenges. The City of Sydney's Strategy, *Sustainable Sydney 2030* (2014),[53] is a leading example of municipal policies that respond to these new challenges. Car share services – which were unknown in the old strategic paradigm – are identified under *Strategic Direction 3 – integrated transport for a connected city*.

However when the breadth of the impact of a car share services is taken into consideration, the development of the service could have been mentioned under a number of the targets and directions across the *Sustainable Sydney* Strategy including:

- Reducing greenhouse gas emissions
- Using ecosystem services
- Maintaining global competitiveness by developing good transport networks, reducing the negative impacts of congestion and improve health and wellbeing
- Increases in the trips to work using public transport by bicycle and by pedestrian movement
- Every resident will be within reasonable walking distance to most local services, including fresh food, childcare, health services and leisure, social, learning and cultural infrastructure.
- People who live in the city are less likely to own a car, less likely to have a driving licence, and less likely to use a car for short trips. Residents of the city walk or cycle for nearly half of their average weekday trips.

- More affordable housing.

Beneath *Sustainable Sydney 2030* sits the City of Sydney's *Connecting our City: Transport Strategies and Actions 2012*. One of the 'key actions' is to 'continue to support car share'. The document does not include specific targets, goals or performance measures for car share. By contrast targets have been established for other elements of the transport system (even those not under direct control of Council), including:

- Provide sufficient public transport capacity to support employment and population targets
  - 8% increase by 2015 compared with 2011
  - 35% increase by 2030 compared with 2011
- Journey to work by 2030
  - 80% of Central Sydney work trips by public transport,
  - 10% by walk/cycle,
  - 10% by car/taxi/ motorbike

Beneath *Connecting our City* sits the current car share policy (which predates both higher level documents). The purpose of the car share policy is articulated as a participation goal: 'The City of Sydney is committed to increasing the uptake of car sharing to 10% of all households by 2016'.

The City of Sydney is to be commended for setting and then reaching this ambitious goal. The successful accomplishment of the goal has ensured that Sydneysiders benefit from the largest car share network in Australia.

Underneath the goal are a number of 'specific objectives':

- Use street parking more efficiently
- Reduce greenhouse emissions
- Contribute to the viability of small business in inner-city neighbourhoods (by reducing the costs of or giving them access to a van)
- Reduce congestion by reducing total driving and on-road congestion
- Slow growth in private vehicle ownership.

These objectives have difference 'characters' that need to be understood.

Two are indicators of the performance of the car share service: reduced VKT and slowing the growth in ownership.

Some are downstream consequences of an effective network including: reduce greenhouse emissions, use kerbside parking space efficiently and reduce congestion. The achievement of these objectives follows from the 'performance indicators' and is not necessary as separate "objectives".

The small business objective is an opportunity that could occur (or not) whether or not the performance indicators and their consequences are positive.

Ideally the high level goals of a municipality such as 'people are less likely to own a car' would be linked to a performance indicator such as 'ownership rates' that can be directly influenced by the car share service. The car share service would then be managed to reach a specific objective that influenced ownership rates. The closest an Australian municipality has got to this linkage is the City of Moreland in Melbourne which among its 'low emission transport goals for 2020' set the target of retiring 5,000 cars by establishing 500 car share bays.[54]

This chapter considers the impacts of an extensive car share network alongside the directions outlined in *Sustainable Sydney 2030, Connecting our City* and the existing car share policy in order to

identify performance indicators that would better link the high-level City strategies to the next phase of growth in the car share network.

## 6.2. GOAL: REDUCING THE RESIDENT VEHICLE FLEET

One of the key strategic factors that car share networks can influence is the size of the resident vehicle fleet. In the past this has grown in step with the population as described in the 'motorisation rate' or the number of cars per head of population.

In the City of Sydney we can understand the size the current resident vehicle fleet in two ways[55]:

- The 2011 ABS Census recorded the resident vehicle fleet being 55,283 in 2011
- The NSW Household Travel Survey 2011/12 (HTS) estimated 67,000 vehicles (21% higher than the ABS)

Based on the NSW HTS data there is one car for every three residents in the City of Sydney. This is a motorisation rate of 35 vehicles per 100 residents. This is relatively good by comparison with the Australian average (which is twice as high) but is not as low as some other Australian municipalities such as the City of Melbourne. Based on this motorisation rate and estimated population growth it is likely that an additional 4,000 cars have come to the City of Sydney over the 3 years since the data was last estimated.

Over the next ten years (2016 – 2026) the population in the City of Sydney is expected to grow from 200,000 to over 245,000 people – an increase of over 22%. Growth in the municipal population is likely to come with growth in the motor vehicle fleet. If this growth occurs on par with the current motorisation rate (which seems likely) then an additional 15,000 vehicles will be stored in the City of Sydney by 2026.

This increase in the resident vehicle fleet will need to be stored (at least overnight) and will have a significant impact on the built environment and public realm. To give a sense of scale the City of Sydney will need to add more car spaces than the number that already exist at Sydney Airport (which has 13,000 parking spaces).[56] Significant resources and considerable ingenuity will be need to accommodate this increase in car storage within the municipality.

A larger resident vehicle fleet will also have a significant impact on local congestion. While not all the cars are expected to be used every day, to give a sense of the impact if these cars were used on the road system[57]:

- An increase in motor vehicle trips of 15,000 would be equivalent to the expected increase in the number of trips to work by walking and cycling between 2006 and 2036.
- 15,000 vehicle trips are equivalent to one third of the daily traffic on Anzac Parade near Moore Park.

It can be seen that when these resident vehicles are used, they will significantly reduce hard won gains in the efficiency of Sydney's transport network.

To date, the City of Sydney's support for car share services has paid off significantly. The impact of car storage and traffic congestion in the City would be much worse today if the City had not facilitated the growth of car share over the past decade.

Research suggests that the resident vehicle fleet is 10,000 vehicles smaller than it would otherwise have been. This shift in ownership by 10-20% of the resident population has made room for other people (even new residents) to store vehicles more easily and use the road network with less congestion (than there otherwise would be).

Looking ahead, the City can use the car share network to avoid growth in the resident vehicle fleet – a doubling of the size of the current service would reduce the future resident vehicle fleet growth to 4,000 vehicles. A service that was three times bigger than the current one would avoid all growth and actually reduce the resident vehicle fleet (thereby reducing traffic congestion and parking scarcity).

It is suggested that avoiding growth in (or reducing) the size of the resident vehicle fleet should be the main goal of the car share service policy.

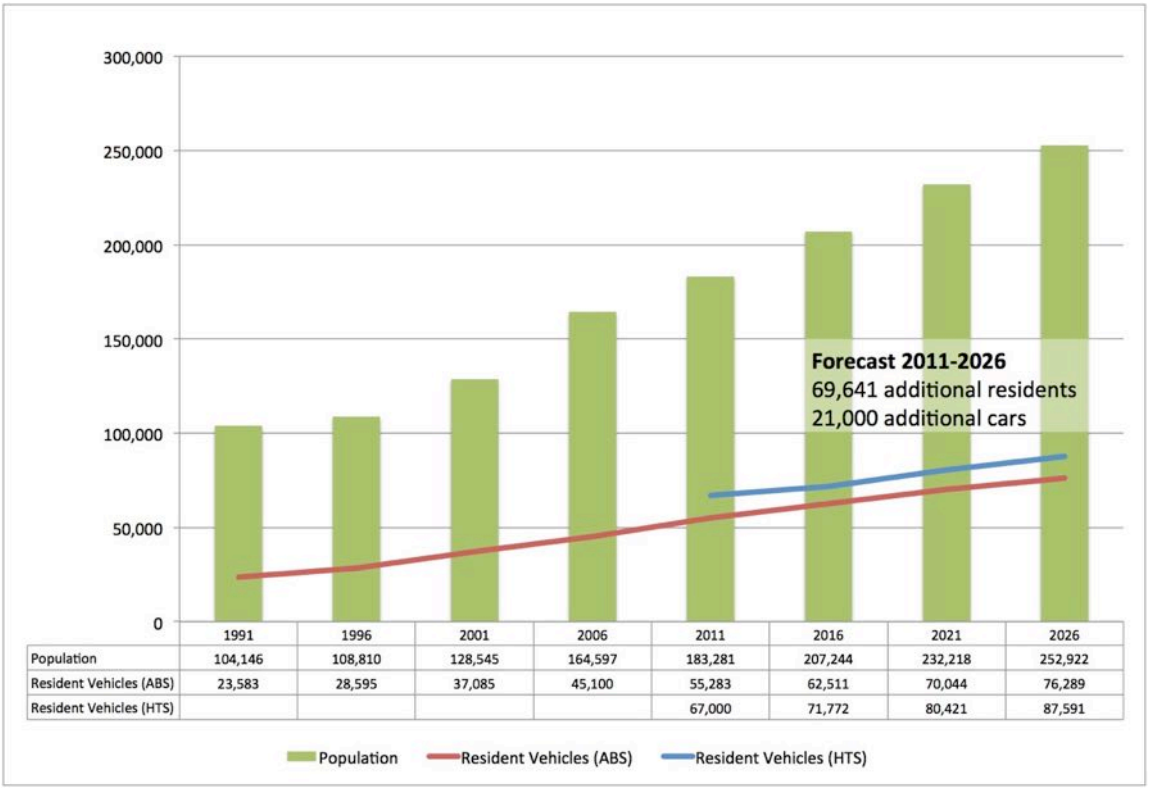
## 6.3. GOAL: REDUCING THE MOTORISATION RATE

The size of the population and the resident vehicle fleet in each municipality is known (with facts from either ABS or HTS). On this basis we can calculate the number of vehicles per person, known as the motorisation rate[58].

In general a high motorisation rate generates significant negative impacts on the transport system, value of the buildings and liveability of cities. When motorisation rates reduce, these negative impacts also reduce.

Figure 15 below shows the forecast growth in population in the City of Sydney and the likely resulting growth in residential vehicle fleet. The growth in the vehicle fleet is shown in red (ABS motorisation rate) and blue (HTS motorisation rate). Vehicle fleet projections beyond 2011 are shown based on the most recent motorisation rate data (2011 for ABS and 2012 for HTS) The rate could of course increase or decrease.

FIGURE 15: FORECAST GROWTH IN POPULATION AND CARS IN THE CITY OF SYDNEY




| | 1991 | 1996 | 2001 | 2006 | 2011 | 2016 | 2021 | 2026 |
|---|---|---|---|---|---|---|---|---|
| Population | 104,146 | 108,810 | 128,545 | 164,597 | 183,281 | 207,244 | 232,218 | 252,922 |
| Resident Vehicles (ABS) | 23,583 | 28,595 | 37,085 | 45,100 | 55,283 | 62,511 | 70,044 | 76,289 |
| Resident Vehicles (HTS) | | | | | 67,000 | 71,772 | 80,421 | 87,591 |

*Sources:* *Population; ABS Census Estimated Resident Population Resident Cars; 1991 to 1996 - id Profile, 2001 to 2011 - ABS Census, 2016 to 2021 – BTS population and dwelling forecasts*

Using ABS data, the current motorisation rate is 30 vehicles per hundred people in the City of Sydney – a low rate for Australia but similar to the rate in the City of Melbourne. As might be expected the motorisation rate has been rising over the last twenty-five years. The City of Sydney had a motorisation rate of 23/100 people in 1991. This grew to 30/100 people by 2011.

Using the most recent HTS estimates (2012), the motorisation rate is higher (at 34/100). This would mean that the City of Sydney has a motorisation rate higher than the City of Melbourne (ABS 2011).

Looking ahead the City can use the car share service to achieve an acceptable motorisation rate by setting a specific target.

Table 15 shows the motorisation rate of various cities including the City of Sydney without the current car share service.

TABLE 15: RATIO OF POPULATION TO PRIVATELY OWNED VEHICLES IN LOCATIONS

| MUNICIPALITY | RESIDENT CARS | POPULATION | MOTORISATION: CARS PER 100 PEOPLE |
|---|---|---|---|
| Australia[59] | | | 69 |
| European Union | | | 52 |
| City of Port Phillip | 48,000 | 98,000 | 49 |
| City of Yarra | 34,000 | 79,000 | 43 |
| **City of Sydney (without car share service 2015)** | **81,000** | **200,000** | **40** |
| **City of Sydney (HTS 2012)** | **67,000** | **188,000** | **35** |
| City of Melbourne | 31,000 | 100,000 | 31 |
| **City of Sydney (ABS 2011)** | **55,000** | **183,000** | **30** |
| Paris, Amsterdam | | | 25 |
| Singapore | 1,000,000 | 5,000,000 | 20 |

*Source: 2011 ABS Census with PBA analysis*

The motorisation rate is clearly critical for the City of Sydney's overall strategy relating to vehicles on the road and storage space. It would make an appropriate target for the next phase of the car share strategy.

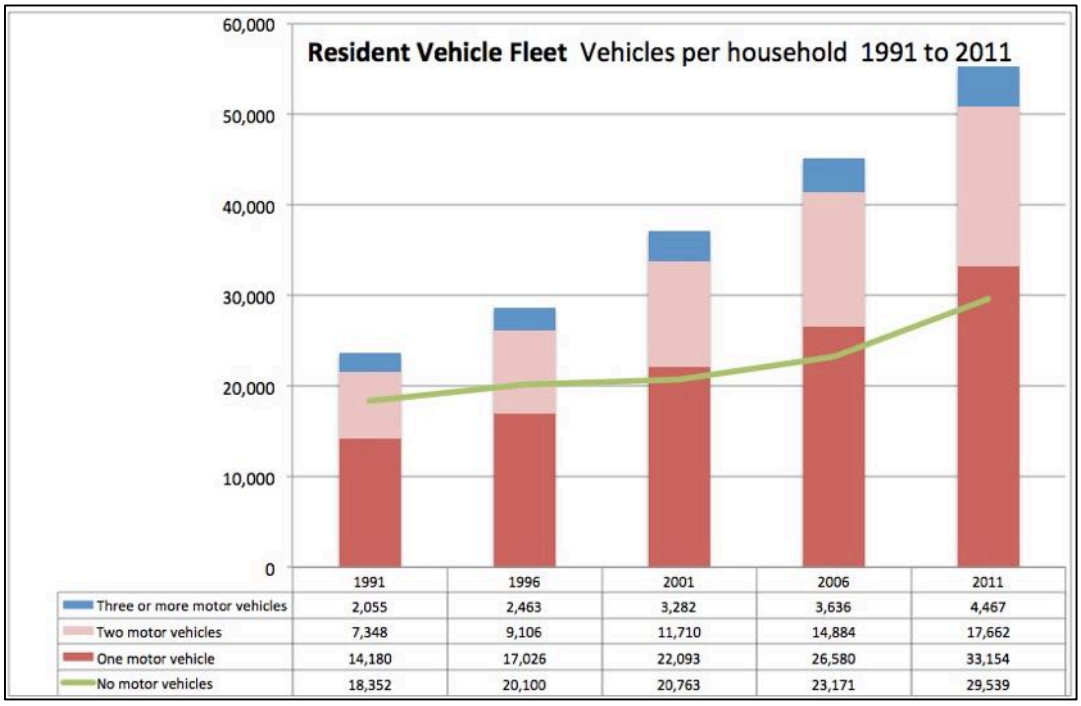
The current car share fleet has had an impact on motorisation probably reducing it by 5 cars per 100 residents.

## 6.4. GOAL: MORE ZERO CAR HOUSEHOLDS

Another available measure and one that links the car share service to the Council's land management goals is the number of zero car households.

The number of vehicles per household can be monitored using the ABS data. Figure 16 shows the zero, one, two and three car households in the City of Sydney.

FIGURE 16: CARS PER HOUSEHOLD: 1991 TO 2011: CITY OF SYDNEY




| | 1991 | 1996 | 2001 | 2006 | 2011 |
|---|---|---|---|---|---|
| Three or more motor vehicles | 2,055 | 2,463 | 3,282 | 3,636 | 4,467 |
| Two motor vehicles | 7,348 | 9,106 | 11,710 | 14,884 | 17,662 |
| One motor vehicle | 14,180 | 17,026 | 22,093 | 26,580 | 33,154 |
| No motor vehicles | 18,352 | 20,100 | 20,763 | 23,171 | 29,539 |

*Source:* *Population; ABS Census Estimated Resident Population Resident Cars; 1991 to 1996 - id Profile, 2001 to 2011 - ABS Census*

The following observations can be made:

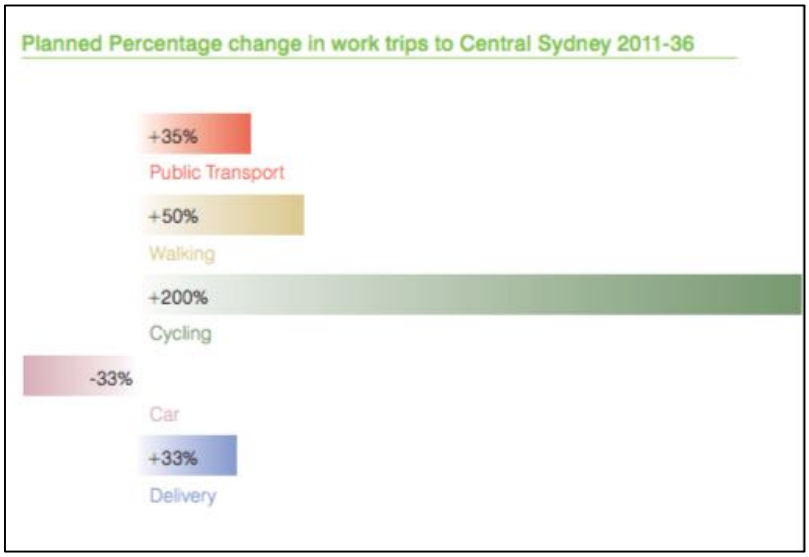
- Since the year 2000, zero car households have begun to grow strongly in number and proportion. (This is not true of all municipalities)
- The largest growth in the last census period was in one-car households.
- The growth in two car households has been steady
- Three car households grew more strongly in the last census period than at any other time.

The data suggests that even though the number of zero car households is growing, it is not yet true that 'people who live in the city are less likely to own a car' as anticipated by *Sustainable Sydney 2030*. In fact while the number of zero car households has fallen, the proportion of zero car households has fallen from 44% to 35% over the period. The proportion of one and two car households has risen by 4.8% and 1.5% respectively.

## 6.5. GOAL: MODE AND TRIP TARGETS

Car share services have a significant impact on mode and trip choice. There is an opportunity is to set targets for car share service on this basis. *Sustainable Sydney 2030* has targets for the proportionate increase in trips to the municipality by 2030 as shown in Figure 17 but no goals for trip numbers or for internal trips. These internal trips are likely to grow as the residential car fleet grows.

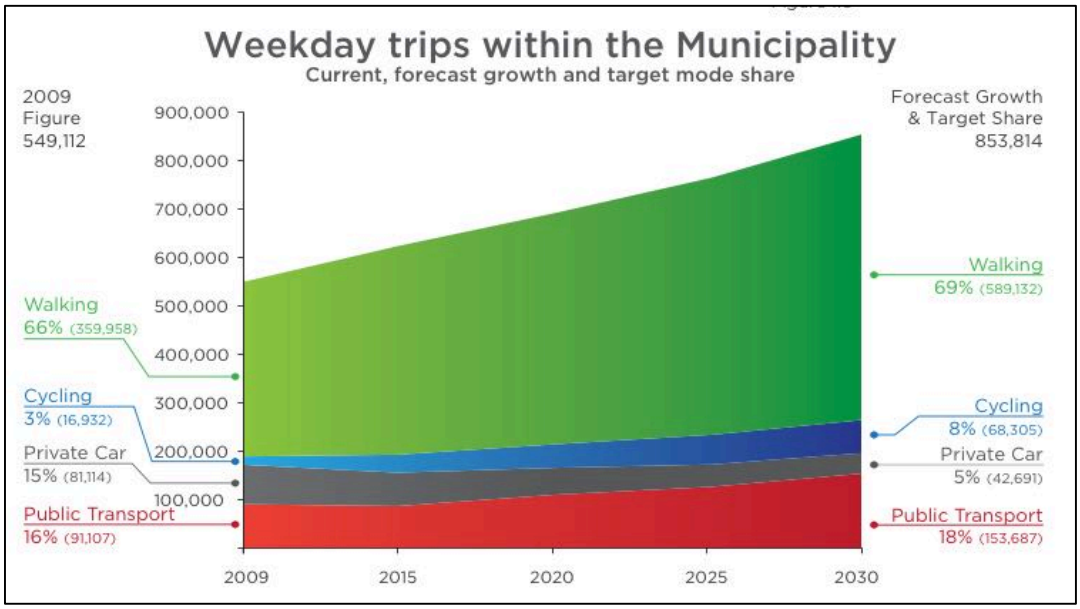
FIGURE 17: TRANSPORT MODE TARGETS CITY OF SYDNEY




*Source: City of Sydney's Connecting our City: Transport Strategies and Actions 2012*

The City of Melbourne, for example, has set 'within' trip targets as shown in Figure 18 below.

FIGURE 18: TRANSPORT STRATEGY 2012 MODE TARGETS: INTERNAL TRIPS




*Source: City of Melbourne Transport Strategy 2012*

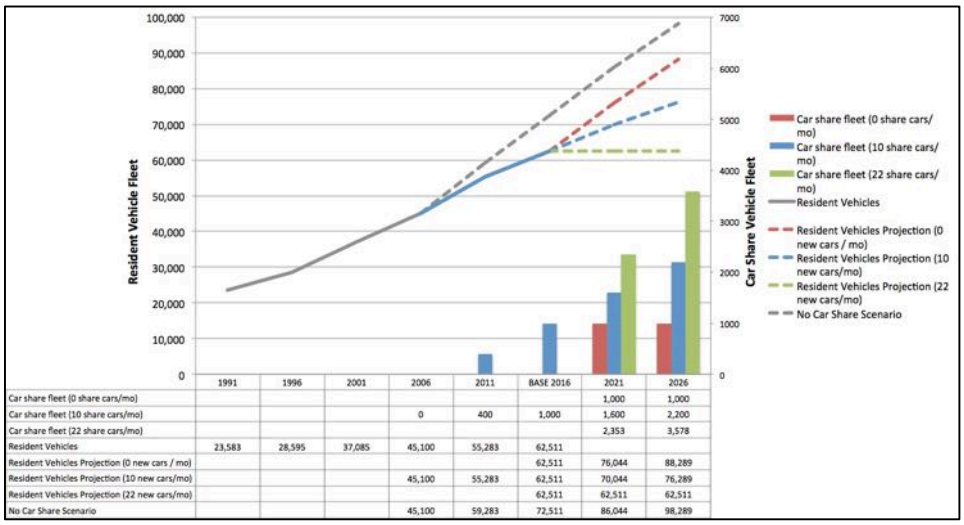
The City of Melbourne target is to reduce the proportion of internal motor vehicle trips by 10% in proportion and 40,000 in number by 2030. This will be a challenging target and to achieve it the City will need to restrict growth in the resident vehicle fleet. If each of resident vehicles from the anticipated 2021 vehicle fleet makes two trips a week, the number of trips in the municipality will rise above the 2009 baseline figure rather than be brought down to the target.

## 6.6. CHOSING A STRATEGY

The discussion below highlights potential strategic choices for future car share networks (with explanation of what each would mean for the City of Sydney):

- **Remove car share and significantly increase the number of resident vehicles**: In theory, the City could wind the clock back and remove the current car share service. The consequences of this would be to add 10,000 more vehicles to the city streets and kerbside parking spaces and expect another 14,000 vehicles to be based in the City by 2021 – a total increase of 24,000 additional motor vehicles. The dotted grey line in Figure 19 below continues (at the current ABS motorisation rate) to show how the resident vehicle fleet would have grown without the car share service. It is unlikely that either the users of the current service or the other residents of the City would support this approach.
- **Freeze car share growth and accept an increase in the number of resident vehicles**: Any municipality could ignore an increasing membership and use of car share services and freeze the service at current levels. Many municipalities in Australia have made this choice. The consequences of this for the City of Sydney would be that another 14,000 vehicles would be based in the City by 2021. The red dotted line in Figure 19 shows what would happen to the resident vehicle fleet if there was no further growth in the car share network but population continued to increase as expected. The red bars below show that by 2026 the (red) car share network would be the same size it is today.
- **Business as usual – continue to grow the car share fleet and the resident car fleet.** Many municipalities have adopted policies that endorse this approach. The consequence of this approach for the City of Sydney would be an increase in the car share fleet from 1,000 to 1,600 vehicles (equivalent to 3% of the resident vehicle fleet) and an increase in the resident vehicle fleet of 10% or 6,000 cars. This trend is shown by the blue line in Figure 19 below.
- **Strategic expansion – avoid all growth in the resident vehicle fleet.** One municipality in Australia (City of Port Phillip) has recognised the importance of this goal. This goal can be achieved in the City of Sydney by increasing the car share fleet to 2,500 vehicles. At this scale the car share network would be equivalent to 5% of the resident vehicle fleet. This trend is shown by the green line in Figure 19 below. Such an expansion should ensure that the resident vehicle fleet does not grow between 2016 and 2021.

FIGURE 19: STRATEGIC SCENARIOS




| | 1991 | 1996 | 2001 | 2006 | 2011 | BASE 2016 | 2021 | 2026 |
|---|---|---|---|---|---|---|---|---|
| Car share fleet (0 share cars/mo) | | | | | | | 1,000 | 1,000 |
| Car share fleet (10 share cars/mo) | | | | 0 | 400 | 1,000 | 1,600 | 2,200 |
| Car share fleet (22 share cars/mo) | | | | | | | 2,353 | 3,578 |
| Resident Vehicles | 23,583 | 28,595 | 37,085 | 45,100 | 55,283 | 62,511 | | |
| Resident Vehicles Projection (0 new cars / mo) | | | | | | 62,511 | 76,044 | 88,289 |
| Resident Vehicles Projection (10 new cars/mo) | | | | 45,100 | 55,283 | 62,511 | 70,044 | 76,289 |
| Resident Vehicles Projection (22 new cars/mo) | | | | | | 62,511 | 62,511 | 62,511 |
| No Car Share Scenario | | | | 45,100 | 59,283 | 72,511 | 86,044 | 98,289 |

*Sources: Population; ABS Census Estimated Resident Population Resident Cars; 1991 to 1996 - id Profile, 2001 to 2011 - ABS Census, 2016 to 2026 ABS resident forecasts*

## The value of these scenarios

The economic model can be used to understand the value of these scenarios. Table 16 shows the relative value of the three car share network growth scenarios. (The resident vehicle fleet is the number of privately owned vehicles based in the City of Sydney).

The City has the opportunity to avoid this cost and gain an equivalent value by developing a car share service that is of sufficient scale to avoid the growth in the number of privately owned vehicles based in the City of Sydney.

TABLE 16: SUMMARY OF ECONOMIC ANALYSIS

| CAR SHARE NETWORK (2021) | NET ECONOMIC VALUE | SIZE OF RESIDENT VEHICLE FLEET (2021) | GROWTH IN RESIDENT VEHICLE FLEET (2016 - 2021) | NUMBER OF RESIDENT VEHICLES AVOIDED (2016 – 2021) |
|---|---|---|---|---|
| 1,000 vehicles (status quo) | $59.7m | 76,000 | 14,000 | 0 |
| 1,600 | $95.5m | 70,000 | 8,000 | 6,000 |
| 2,300 | $137.2m | 62,000 | NIL | 14,000 |

*Source: Phillip Boyle & Associates (PBA) Analysis*

It should be noted that the scenarios above do not account for the economy of scale in mode management that the City of Sydney (and any other municipality) will experience with the increasing size of the network.

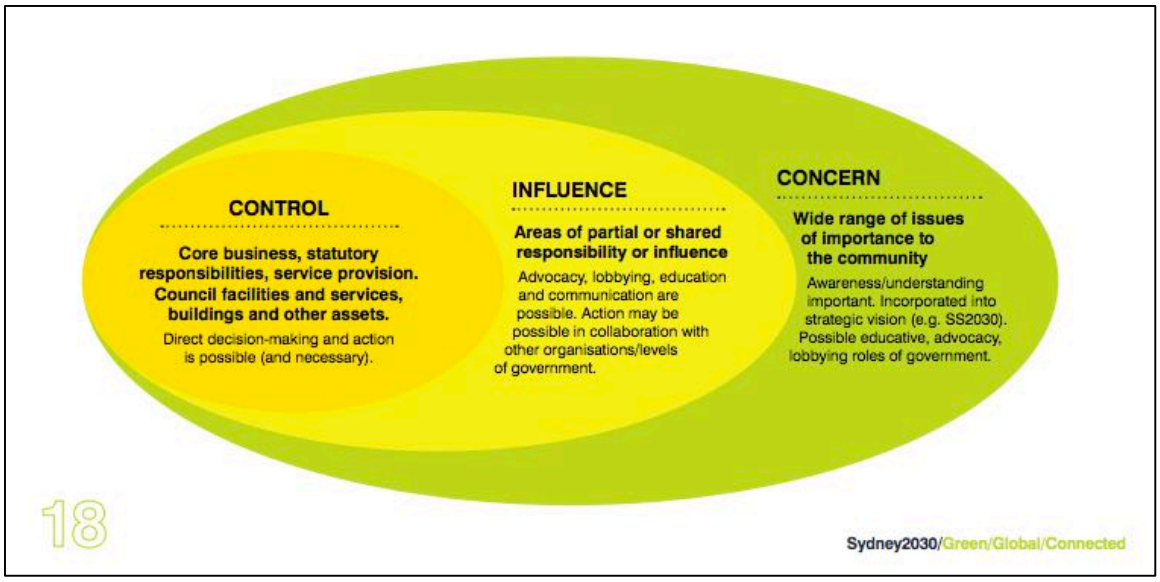
As the network grows, the cost to manage the mode per car share vehicle will reduce as the cost of administration can be spread over a larger fleet of vehicles, and those vehicles that have been existing for a longer period of time will tend to require less staff resources each subsequent year. Due to this the modelling is over-estimating the cost of mode management and under-estimating the net benefits of a larger car share network.

# 7. Council's role as mode manager

This chapter of the report provides a synopsis of world's best practice related to car share mode management and remarks on how Australian municipalities (particularly the City of Sydney) are faring with regard to world's best practice.

Municipalities in Australia do not in general own, operate, regulate or coordinate transport modes.[60] 'Prime responsibility for many transport matters rests with the State Government.'[61] . For transport modes the City of Melbourne notes 'the State Government is largely responsible' with local government holding a 'key role'. [62] In these areas municipalities tend to rely on building relationships with decision makers and exerting influence to shape future improvements. The spheres of municipal influence are illustrated well by the City of Sydney in Figure 20 below.

FIGURE 20: MUNICIPAL SPHERES OF CONTROL, INFLUENCE & CONCERN




*Source:* *Connecting our City: Transport Strategies and Actions 2012 City of Sydney*

Although they do not manage most transport modes directly, municipalities do have ways to control and influence transport choices through their roles as:

- A land use regulator
- An integrator of land uses and transport choices.
- Manager of the pedestrian mode.
- Manager of open space
- Manager of kerbside road space
- Manager of road space
- Some municipalities, like the City of Sydney and the City of Melbourne, have a role at the hub of the public transport system. [63]

Even without control, in the words of the City of Sydney, 'the City has the ability to influence transport outcomes directly by building cycleways, modifying the operation of the street network, balancing parking demand and developing community transport initiatives.' [64]

Car share services stand out as the one transport mode that is the solely the responsibility of local government. By 'modifying the operation of the street network, balancing parking demand and developing community transport initiatives' Councils exercise control over the car share service.

In Australia, the Commonwealth Government approves vehicle design, funds some roads and collects fuel taxes while licencing (of drivers) and registration (of vehicles) is undertaken at the State Government level. Local government is typically responsible for local road maintenance and access though they tend to rely on State Government funding and their ability to tax is typically limited to rates (annual property tax) and user charges (such as garbage or parking fees).

To emphasise local government's role as mode manager the State Government in NSW has issued a Technical Direction that confirms car share issues 'should be left to local government'.[65]

The mode management role (that falls to local government) does not fit into other typical control paradigms familiar to municipalities. For example, with rubbish collection - Councils hold the relationship with the resident, collect user charges and either provides the service or engages the private sector to provide the service under a contract (on behalf of the residents). In the case of car share the service provider has the relationship with the resident, collects user charges and, on behalf of the resident, negotiates the level of service with the Council.

Some municipalities have allowed this anomaly to influence their strategy setting and service agreements with car share services. Other Councils, such as the City of Sydney, have seen that car share services are a way that Councils can 'directly influence transport networks, options and outcomes' and achieve established Council goals in an innovative manner.

It is useful to parallel car share with bicycles – a mode that many (perhaps most) local municipalities seek to 'influence' transport outcomes directly – as it is a mode where local government strategy, policy and practice are more advanced.

Management responsibility for the bicycle mode is shared with State Governments, and many bicycle routes are under direct control of State agencies as they exist on State controlled land. It is however an area in which a number of local governments are determined to drive change and have made considerable efforts independent of – and in some cases despite – the State.

The City of Sydney is an example of this determination. The bicycle strategy says 'full implementation of the works envisaged by the Strategy will be completed regardless of the NSW Government's commitment'. As noted above, in 2014-2015 the City of Sydney planned to spend $28.5m on bicycle facilities in order to (among other goals) lower greenhouse gas emissions; lower air pollution and reduce health costs through increasing physical activity.[66] In many other jurisdictions (including in metropolitan Sydney) local government wait for State leadership on bicycle network planning and improvement.

In order to derive these benefits the City of Sydney, among other initiatives, works to:

- Define a coordinated network
- Ensure local access for residents and visitors to the mode to a set standard in minutes
- Integrate the mode with pedestrian and public transport networks
- Implement social initiatives to encourage behaviour change so that the mode becomes normal
- Invest in infrastructure consistently over several years

The City has set targets for the number of trips by residents, as a proportion of total trips and for the useability of the system by people in the metropolitan area and works to:

- Ensure usability by people of different ages
- Ensure appropriate consideration in user hierarchies
- Ensure access at work places

This role of 'mode manager' or 'mode developer' – terms that imply the formulation of strategy, facilitation and supervision but not ownership – is the role that is available to Councils with respect to car share services.

Just as a Council can decide how extensive, reliable and active a bicycle network will be, they can do the same for a car share network. The activities that a mode manager should undertake with car share include:

- Set overall targets for the service against population
- Define a coordinated network based on land use, catchment metrics and current travel patterns and behaviours
- Identify suitable parking bays that support the network
- Set standards for level of service including coverage, reliability and equity
- Develop a deployment plan that guides the roll out of vehicles including bay identification
- Develop social initiatives to encourage uptake
- Establish agreed approaches within a context of cross-divisional cooperation including statutory planning, parking and traffic management
- Establish performance standards including: availability, vehicle activity, membership (business resident ratio per car
- Establish internal and external reporting procedures
- Establish consultation, feedback and grievance procedures.

This section considers the various aspects of mode management of car share services and how they have been understood and implemented in Australia.

## 7.1. SETTING STRATEGY

As the mode manager, a Council has one high level strategic decision to make: whether to facilitate, be neutral or suppress this new type of service.

This decision – like other similar decisions made by Councils – will be based on the level of community benefit that can be derived from the service and the perceived level of community support for the services.

The benefits, which vary from Council to Council, have been described and quantified (earlier in this report) with respect to the City of Sydney. The level of support within the community is high, but it is the perception of this support amongst decision makers (Councillors in particular) that is of critical importance. This perception tends to vary by municipality and is significantly influenced by the number of residents who are members and the level of engagement that those members have with their local elected officials.

In general the service will have high relevance where walking and alternative transport options offer a high level of service. In these areas people will use their cars less and a car share service will be an attractive alternative – particularly if some infrequent travel still requires car use.

In the City of Sydney there are around 40,000 members of the various car share service providers (around 20% of the total population). This proportion is the highest in Australia and may in part account for the City of Sydney's highly proactive approach to expanding the car share network.

The high level strategic decision will in part define the relationship between Council and the local car share service providers and users (be they businesses or residents).

Currently around 10% of Australia's metropolitan municipalities have some form of car share service operating. The current situation as come about in a range of ways including some councils:

- Addressing the strategic question after being approached by private service providers
- Exploring the strategic question before they are formally approached. Perth and Darwin, two CBD councils without a service, as well as the ACT Government (municipal services division) are investigating the relevance of the service in their context
- Experience services initiated without knowledge of the municipality (only likely where parking is unrestricted).

The City of Sydney made their strategic decision to facilitate the service at a very early stage when the private sector was in its 'start-up' phase. The City of Sydney's unambiguous strategic decision and the ongoing steady support has been the reason the community enjoys the benefits of a large-scale service in that municipality today.

## Strategic definition of the service

Interestingly no Council in Australia has framed their strategic conversation around the core outcome of car share services (that of reducing levels of car ownership).

Some Councils have based their strategic commitment on particular benefit streams from the service such as reduced greenhouse gases, relieved parking stress or social equity. The ACT Government is exploring the service for a number of reasons including the reduced 'costs of ownership', but not ownership itself.

The City of Sydney car share policy defines the service as a 'complement' to sustainable travel modes. A number of other Councils have adopted this term in their policies. Possible interpretations include an 'extra feature' of the transport system which is certainly true. Another implication in the phrase is that the service is not considered to be a 'sustainable' travel mode. This exclusion depends on a definition of sustainable.

The weakness of the concept of 'complement' is that it does not communicate the powerful impact on people's travel behaviour when they move from owning a car to using car services. When people switch from ownership, a car trip changes from the default choice to a pay-per-use option. This triggers a continuing increase in walking, riding and public transport use.

Traditional transport improvements tend to provide an option that didn't previously exist (be it a link, capacity, frequency or safety improvement). Car share by contrast actually changes the way people decide whether or not to use a particular mode and affects the fundamental price trade-offs that each individual makes. This is more powerful than an 'extra feature' it is an active agent of change and the foundation of a transport system that favours walking, cycling and public transport.

The City of Melbourne has formally defined car share services as a form of 'public transport'.[67] Car share services are part of the integrated 'public transport' system that for some people means '*It will be possible to live and do business in inner Melbourne without needing a car.*' The implication is that people will not 'need to own' a car, but that is not made explicit.

The City of Sydney 2012 Development Control Plan defines demand management as 'the measures taken which minimise the need to travel, the length of trips - particularly by car, and encourages travel by the most sustainable mode of transport.' This definition of demand management is focused on trips rather than vehicle ownership.

The current strategic settings reflect the fact that until the advent of car share services it was not economically, socially or politically possible to tackle levels of car ownership directly. As a result, incumbent strategies focus on improving alternatives rather than changing the default mode.

The scale that car share services have reached – particularly in the City of Sydney – shows that car ownership levels can now be the subject of strategic debate and effective policy settings.

## Confusions around strategy

The strategic consideration of car share services in Australia has been clouded by a number of factors including:

- Lack of understanding what the services are
- Fear that innovation may have adverse consequences
- Invisible residents (beneficiaries of the service)
- Rapid growth
- Falsely framing the service as 'big business'
- Lack of understanding the benefits
- Behaviour of service providers.

These are discussed briefly below.

### Understanding what the services are

The actual service being provided is still not well understood by decision makers in Australian municipalities - most of who do not have first-hand experience of using the service.

Conceptually the service is in a new service offering within a rapidly evolving industry sector (the shared economy). The difference between renting and owning is well understood but not its application to cars. Car services are new in two ways:

- Historically using a car meant owning a car. Cars have not been in the category of things that you can 'either rent or own' like books, swimming pools and apartments
- Traditionally when cars have been rented out of a depot it is as a short-term extension of ownership rather than a full time alternative.

The 'concept gap' has made it harder for decision makers to understand what the service to the community and its benefits.

### Pigeon-holed Innovation

Most people tend to view innovations through historically known paradigms. Car share services are categorised by various stakeholders in simple terms such as 'more cars', 'another demand on limited parking', 'more public transport' or 'business trying to gain value from public space'. None of these completely explains what is a very simple but unusual new type of transport service.

Based on this lack of understanding the fundamentals of the service, some Australian Councils have excluded the service from consideration or woven it into existing programs and budgets. This phenomenon is not new and has occurred with other types of service such as kindergartens being grouped with ageing and maternal and child health rather than with 'education'. It then takes many years for the service managers to investigate and understand the role that local government should be playing with respect to the innovation.

### The invisible resident

One of the most damaging impacts on the development of strategy has been the absence of the resident from the conversation between the service provider and Council. Current or future pedestrians and bicycle riders are sharply in focus for Councils but residents who use, want to use or would find that they want to use car share schemes are often invisible to Council decision makers. Some Councils in Australian have banned the service even though residents would like to use it. Apart from liquor licencing bans (established in the 1920s) there are few Australian examples of local government excluding residents from accessing a service in this way (those type of decisions tend to be made at a State or Commonwealth level).

Councils would be more proactive if potential users of the service were demanding it be provided (as happened with roads and tramways in the mid 19th century).

### Rapid growth

Rapid growth in services provided (and the companies involved) has clouded the strategic debate. The services began as plucky local start-ups that had 'members' (which made them appear like not-for-profits) and cars with cute names. They quickly turned into medium size commercial enterprises. The apparent scale changed again when international corporations appeared in the market (even though businesses have remained independent local entities). The rapid change in scale and apparent change in character caused observers to believe that there was another new technology "gold-rush" underway and decision makers became wary of how public assets could be used for 'private gain'.

### Falsely framing the service as a 'big business'

The change of scale reinforced the framing of the service as 'big business'. This framing is based on the notion that business should not benefit from use of public assets. However public transport services including large transnational companies such as Keolis, Transdev and MTR as well as local taxi companies and bus operators all benefit from exactly the same public assets (land and kerbside space). Local government does not seek any financial return for setting aside this space. The only benefit is that of improved transport services to the local community.

The 'private benefit from public space' framing also fails to take into account the use of public space by businesses and residents to store private vehicles (at home or work). The value of the kerbside space occupied by resident vehicles in the City of Sydney is estimated to be more than a billion dollars. There is no expectation that users of this space (even non-resident users) should pay for the true value of the land they occupy, rather they are charged a nominal fee in an attempt to manage occupancy rates.

### Understanding the financial contribution of the private sector

Municipalities have typically been slow to recognise the significant advantage of securing private sector assets for their community's use. When a private company provides car share services Councils (and some residents) avoid having to make capital contributions or take any financial risk on the service.

Managing a transport mode usually comes with significant financial exposure and risks. For example some toll road in Australia have come with billions of dollars of risk to the government. Even in franchising of public transport the government tends to pay for the vehicles (often billions of dollars of capital investment with no guarantee about how much they will be used by customers). By contrast a local government such as the City of Sydney has managed to introduce a car share fleet worth over $20m, without contributing any significant capital funding. This capital saved has been available for other purposes, such as bicycle infrastructure.

### Behaviour of service providers

In Australia (across all start-up sectors) service providers need to spend most of effort on business basics (such as achieving consistent cash flow) rather than on communicating with local government about the community benefits they are providing. This has lead to a poor understanding of the opportunities and constraints related to local government. Councils tend to under-appreciate the initiative of service providers (some even believing that they have given service providers amazing advantages). Yet, no Australian Council has given car share service providers an advantage greater than that provided to either the bus, freight delivery or taxi industry (both of which include many private sector businesses). In fact most municipalities have put in place onerous requirements that are not imposed on other transport sectors.

In some cases when providers have taken the initiative and established locations on private land and in areas where kerbside parking is unrestricted, some municipal staff have taken umbrage, resulting in a negative view (and attempted restriction) of the services.

## 7.2. PROVIDING SERVICES

Once the public benefit has been identified, quantified and a strategic decision made to establish a service in order to reap the public benefit, the next decision Councils have faced is how to provide the service.

Councils have a number of options:

- Run the service themselves
- Contract others to do it
- Manage (and encourage) private sector service providers.

Historically, some Australian municipalities have managed (and in some cases established) bus and tram networks, electricity services and sewerage networks. Public transport services have also been set up by private operators and later been taken over by governments.[68] It is quite possible that car share services will go through similar changes of ownership and operation over a similar period of time (decades).

There is little doubt that many Australian municipalities could run a car share service for residents and businesses in their municipality. Almost every municipality in the country owns a fleet of vehicles that is shared by staff during business hours. Even in the locations where car share services are provided, the municipal car fleet is often larger than the fleet of car share vehicles.

The scale of car share services is smaller than library, swimming pool or rubbish collection services that the Councils routinely take responsibility for. Recently the City of Sydney committed $400m to a new swimming pool in Green Square and $220m for the new light rail line. These are both about ten times the amount required to finance the current car share network.

Today no Council in Australia is operating a car share service. Those that support car share services fulfil their mode management role and rely on significant investment from one or more private service providers.

This arrangement is a win-win. Councils gain a community service without having to put up the capital or run the service while investors take financial risks to establish the network and test whether services can deliver a return on their investment. This win-win arrangement held for a number of years in the case of railways, tram lines and bus networks.

However, Councils and State Governments were drawn into running and providing capital for the services when the community demanded services be extended in ways the private sector found too risky or unprofitable.

History suggests that it is in a Council's interest to support the private providers of car share services for as long as possible to postpone (or avoid) the moment when they will need to 'step-in' and provide the service, just as they do with libraries and swimming pools. These existing arrangements contain valuable lessons for the mode management of car share services. [69]

Australian local governments that choose to establish car share services are likely to subcontract a service provider based on a contract with a defined geographic area and metrics related to availability, reliability and service quality. The service contract might include elements that address social disadvantage or inequity. Typically the service contract would be with one service provider for the whole municipality but could include multiple service providers. These types of arrangements have the subject of 'expressions of interest' in both Darwin and Melbourne during 2015.

Table 17 below compares a number of established Council services with car share services.

TABLE 17: MODELS OF SERVICE DELIVERY

| SERVICE | MANAGED BY | COUNCIL POLICY IMPACTS ON | COUNCIL PROVIDES | EXTERNAL RESOURCES |
|---|---|---|---|---|
| Library | Internal | Opening hours<br>Coverage<br>Location | Land<br>Infrastructure<br>Consumables<br>Staff<br>Operating subsidy<br>Financial Risk | - |
| Swimming pool | Not for profit (E.g. YMCA) | Opening hours<br>Coverage<br>Location<br>Pricing including for low income users | Land<br>Infrastructure<br>Operating subsidy | Staff<br>Revenue collection<br>Financial Risk |
| Rubbish | Private sector | Coverage<br>Frequency<br>Bin capacity<br>Materials collected | Bins<br>Kerbside space<br>Revenue Collection<br>Operating subsidy | Land<br>Infrastructure<br>Staff<br>Financial Risk |
| Car share | Private sector | Coverage<br>Location<br>Reliability<br>Type of vehicle<br>Signage<br>Growth Rate<br>Financial Risk | Kerbside space | Infrastructure<br>Staff<br>Revenue collection<br>Financial Risk |

*Source:* *PBA Analysis*

It is clear that despite similarities between various community services, municipalities deal with them differently (although norms tend to form based on how much financial and political risk can be transferred to the private sector). It is also apparent that in some municipalities, the Council provides relatively modest assistance to service providers, yet (through policy) places significant

burden on service providers (such as vehicle type, growth rates and financial risk) that they do not impose on other community services.

## Confusions around service provision

The setting of service criteria for car share services in Australia has been clouded by a number of factors delaying the benefits to the community.

### Profit

In discussions about service provision the question of 'for profit' businesses is often raised. Some councillors object that car share service providers are 'companies' and 'make a profit'. However most service delivery and transport companies – rubbish collection, freight delivery companies and taxi operators for example – are profitable businesses. Councils do contract with not for profits such as the YMCA to run swimming pools but these organisations are also businesses in the sense that they often return a dividend to the parent organisation for wider community benefit.

Paying profit making businesses to provide services to the community is a common role for Councils. In the case of car share service providers, Councils are not being asked to pay, but contribute through access to parking spaces. As the industry sector matures and community understand the benefits of the service there will undoubtedly be geographic areas that are 'left-out' of the service coverage and local governments will need to decide whether to resolve that inequity.

### Subsidy

In discussions about service provision the question of subsidies is often raised. In the transport domain subsidies are commonplace and provided to every sector in one form or another. However some municipalities have recently sought to make the car share sector the sole part of the transport sector that does not receive any government assistance. This has manifest itself in the form of a view that the services should be provided in a manner that is 'cost-neutral' to government. Such an approach will only serve to restrict the coverage of car share services to the most profitable geographic areas.

In Australia, State Governments routinely provide 'subsidies' to transnational companies to provide train, bus, tram or ferry services. The subsidy covers the difference between operating costs (usually 3:1) plus a profit margin (typically around 6%) and could also include fares that are collected. For similar reasons the Commonwealth subsidises air services.[70] As noted above, many of these systems benefit from an additional 'kerbside space' subsidy provided by local government.

Some transport services can deliver benefits without a cash subsidy. Skybus in Melbourne pays a franchise fee to the State Government and a fee to the airport while making a profit on the remaining ticket revenue. It does however use infrastructure and vehicles initially provided by the State government and is eligible to claim fuel input credits from the Commonwealth government.

Outside the domain of transport, the principle of Councils not subsidising private business is contradicted by the provision of a number of subsidies to local businesses including: kerbside loading zones, rubbish or recycling collections, streetscape enhancements and retail promotions.

### Monopoly and monopsony

Some municipalities question the efficacy of having only a few car share service providers (as it would seem to limit competition). Most Councils have multiple providers and those that only support one service provider by policy or practice do not have large networks. Both situations

have advantages and disadvantages. Where usage is not growing or if Council is suppressing the service, it doesn't matter which approach is taken.

If however the mode manager wants to gain as much community benefit as quickly as possible, then the capability of the service providers is much more important than the number. A mode manager seeking growth will need providers that are effective recruiters and have the financial capacity to expand the number of vehicles quickly (as demand grows). Any service provider that has these qualities will be able to meet the mode manager's goals. By contrast any number of service providers without these attributes will not be able to meet the goals, and thus a greater number of providers may actually hinder the mode manager.

For users there is little benefit in having access to multiple providers, as the real competition is between owning a car and not owning a car. The car share industry is competing with car ownership (a market in which there is significant competition). The sector has not yet matured to the point where each service provider is competing for a finite number of customers (rather they are still unearthing entire segments of new market and customers through geographic expansion). For this reason competition between operators is not essential in order to ensure optimal outcomes for customers (as the competition is with car sales showrooms).

In addition, each user tends to only belong to one service (unless the mode manager facilitates multiple memberships). For this reason users could be seen to favour monopoly as they would benefit in a similar way to the users of railway networks that have one operator and integrated ticketing.

Some Councils are worried that a sole provider would use their position to drive up prices for the user. This need not be a concern, as the service provider is not competing with other service providers but competing on price and convenience with the incumbent social norm of 'car ownership'. This competition is severe. Most people judge their car ownership and use costs by the fuel cost, which is around 15% of the actual costs. Car share services have to compete with this falsely low perception of price – especially when dealing with people considering the service.

Some Councils are worried that a sole provider will be motivated to grow the user base and car network faster if they were in competition with another provider. This is not the case, as increased competition for members can significantly increase the financial risks and uncertainties associated with expansion. As shown by growth rates in the City of Sydney, sole operators are able to grow quickly and are likely to see future arrival of international competitors as greater motivation to improve services and increase their scale.

For the mode manager a single service provider makes the liaison task easier. Some Councils are concerned that a sole provider would strike a harder bargain with them. This is unlikely to be a problem as the mode manager can invite other service providers to participate.

The Council – at least as far as kerbside space is concerned – is running a monopsony where there is one buyer and many sellers. It does not really matter whether they use this power to set up a provider monopoly or not as long as they manage the performance of the service provider, have mechanisms available to stimulate improvements in performance and can 'hire and fire' providers.

### Owning the users

For most types of community service a Council can change the service provider relatively easily. In general people don't mind who runs the swimming pool or sweeps the streets as long as the job gets done. In these cases the service provider can be changed without directly consulting or disturbing the customers.

However as noted above, unlike the rubbish collector, street sweeper or pool manager, in the case of car share, the service provider has the relationship with the resident. In a sense the service provider 'owns' the users. Local government's role is therefore limited to providing equitable access for multiple service providers and should not typically extend to dictating which service providers residents can use. If a Council sought to exclude an existing operator (or reduce the level of service it provides) there would likely be negative feedback from residents to the Council.

If a service provider were providing a poor service with low recruitment, membership loss and low car usage the Council would probably have the support of the users in replacing the service.

However it would be more difficult for a Council to replace a large-scale service that was doing an adequate job in the eyes of its customers:

- Council would need another large-scale service that was willing to step in and could quickly deploy enough vehicles. This service provider would be wary that Council might one day choose to remove them and may be reluctant to take the financial risk.
- Council would also have to work out how to transition users from one service to the other. Users would find this process disruptive. Generally, neither users nor the service providers mind if locations in a neighbourhood are moved to equivalent or better places as long as the users are still near 'their cars'. Nor do users generally mind if the cars are switched between locations or the type of vehicle is changed. But if a significant area of service were removed or replaced the users (who are also ratepayers) would find this disruptive. They would also be unhappy if the new company were not better than the previous company.
- Perhaps most importantly there would a strategic penalty. The vehicle and membership transition would slow growth and for some would trigger defection back to private car ownership.

It is unclear how any municipality can exercise full control over private businesses such as car share service providers – even by operating services themselves. Pragmatically they have to accept that once they get a service going and it is meeting the needs of the users, then Council no longer controls how or where the business operates or invests. Many Australian municipalities have found a similar situations when trying to close swimming pools as the users exert direct political influence over Council. As the mode manager the Council can shape, support or suppress the service but over time the ability to change or remove services decreases as they get more popular.

## 7.3. DESIGNING EFFECTIVE NETWORKS

Having set the strategy and decided how to provide the service the mode manager's next task is to design an effective network.

### Network design

Many Councils in Australia have designed bicycle networks for their municipality in order to maximise the positive benefits associated with that mode (despite not being paid by the users). Municipalities that wish to facilitate walking develop pedestrian improvement strategies. In Australia this network design approach has not yet been applied to car share services; as most municipalities have overlooked the process of network design, instead allowing their car share network to grow in an ad-hoc manner.

Australian municipalities have typically left the network design task to the service providers and then approve (or disallow) the establishment or expansion of nodes that are suggested. The service providers generally seek to expand their networks organically by establishing new nodes where they have members slightly outside the catchment of the existing nodes.

The networks that emerge from this approach have a number of weaknesses as they:

- Do not reflect the underlying land uses
- Reflect the car share service providers perceptions of business and financial risk/return
- Are often in locations that the service providers perceive to be 'easier' to get approval (not necessarily those that Council would like to grant approval for)
- Can be too far apart or too close together
- Do not provide equitable access to the whole community.

In addition because there is no overall plan or network design, Councils are often compelled to consult internally and externally on each new node or vehicle. The process of repeated, piecemeal consultation takes a significant amount of time and, by focusing on sites rather than the whole network, obscures the overall goals of the service. In some cases it has stalled the expansion of the network.

Another consequence of relinquishing the network design role is that municipalities overlook the contribution of vehicles that are located in off-street locations. Even though these vehicles are an important part of the overall network Councils typically do not include them in public maps or assessments of the performance of the service.

## Favourable contexts

### Development, population and density

In Australia the car share networks have been expanding in lower risk areas with established population density. Network development has not yet been tied directly to new residential or commercial development. Most municipalities are yet to seize the opportunity to make their urban areas more efficient through mandating car share services be provided in the same way they mandate that car spaces bicycle facilities and public art be provided.

The City of Sydney's Green Square model highlights approved developments in white as shown in Figure 21 below.

FIGURE 21: DEVELOPMENT IN GREEN SQUARE CITY OF SYDNEY

*Source: City of Sydney Model Room PBA photo*

Green Square will be one of the fastest growing areas in Sydney with over 10,000 apartments are due for completion over the next 4 years.[71] At the moment there are no plans for an equivalent increase in the car share network in this area. However, the opportunity develop large scale car share use is significant:

- The 'yet to be built' apartments can be adapted to allow vehicles from the car share network to be located inside the building (and be available to the existing wider community). In NSW this process is supported in some local environmental plans. Other States lack equivalent supportive planning regulations.
- The future residents are influenced prior to purchase and in the weeks after their move (both key periods during which people reassess their transport habits).
- Car share memberships can be provided for all apartment residents.

Planning rules including covenants and owners corporation rules, negotiated incentives, practice notes, developer and purchaser orientation sessions are among the issues that can be addressed in developing a network plan in these areas. Retrofitting publicly available car share locations into existing apartments also can be explored.

### Areas with a high journey to work by public transport

The modes chosen for the journey to work can indicate where a car share network is likely to be effective.

In general people make around twenty-four transport trips a week. When ten of these trips - the journey to work – are by car, it is unlikely that people will move away from private vehicle ownership. Conversely, if the journey to work is not by car and other local trips can be made by alternative modes, then the car is likely to be lightly used and the owner is likely to consider car share services as an alternative to ownership.

A critical element for car share service providers in Australia is the relative low density of many areas and the relatively high reliance on private vehicles for journeys to work.

### Areas with high effective job density

Areas with high effective job density also tend to support car share networks. Effective job density (EJD) measures the number of jobs and their proximity to each other.[72] EJD can be used to 'see transport' through the lens of 'jobs'. In general EJD will be higher where efficient transport modes enable the mass transportation of people. In areas with high EJD, car share services support employment density by allowing many people access to cars for work trips without requiring company car pools or commuting by car.

### Low speed zones

Municipalities in Australia have not leveraged the synergy between low speed zones and low levels of car use in the car share network planning process.

A developed car share network is likely to be relevant in areas with low vehicle speeds as the car trip is likely to be perceived as less advantageous while the lower ambient speeds encourage people to make walking and bicycle trips. It is also likely that the development of car share networks will help reinforce the outcomes that low speed zones aim to deliver.

In the City of Sydney, for example, the car share network could be designed to benefit areas with lower speed zones such as The Rocks, Millers Point, Ultimo and Woolloomooloo, which are all signed for 40 kph.

### Permit stress, parking taxes

The car share network can be designed around areas of parking stress, for example:

- Many inner city municipalities manage residential parking through the issue of parking permits. In many cases Council's issue more permits than can be accommodated by the available kerbside space. This causes parking congestion and reduces reliability of finding a car parking space for residents who own cars.
- The NSW State Government Parking Space Levy applies across many business districts in metropolitan Sydney, is likely to affect parking supply and the cost of owning vehicles.
- In areas where new transport capacity improvements (such as pedestrian, bicycle, bus, light rail and clearway projects) are planned, there is often a need to remove on-street parking. Car share services can help to reduce the demand for this parking by reducing the number of vehicles owned (by residents and businesses) in the surrounding areas.

In Australia, car share service providers have tended to attract more members in areas of parking stress. However a lack of political understanding about how car share services relieve parking stress results in some councillors and bureaucrats incorrectly perceiving that car share vehicles increase parking stress. This is a considerable issue for Council's because they restrict growth in the very thing that can help solve one of their most significant problems. It is having less impact on the car share industry at the moment, because there are many different locations to expand and service providers simply move their financial investment focus to municipalities that understand the benefits and have more supportive policies.

Over time however (as use of car share increases) the mis-conceptions about parking stress and the role of the car share network in relieving that stress, will impact on the service provider's ability to satisfy customers. Therefore the industry as a whole needs to gradually become more proactive with regard to political discourse to highlight the benefits they are providing.

Around the world, municipalities that promote the sharing economy (any aspect, not just car sharing) are likely to reduce the cost of living for their residents and the cost of doing business in that location. This will make those municipalities more economically productive and efficient and yield significant benefits in terms of local economic activity and community engagement. The City of Sydney is considered to be ahead of others in this respect (with specific initiatives to make Sydney are '*sharing city*') however it is well behind the global leaders such as Seoul, South Korea in terms of the partnerships that need to be fostered and tangible support that needs to be provided to start-up sharing service companies.

## Placement of nodes and deployment of vehicles

In general Australian municipalities allocate individual car parking spaces rather than designing networks of locations based on defined catchments and evidence based criteria. This is true for shared parking spaces related to taxis, loading and even bus networks. The starting point in this type of process tends to be 'what spaces are available for this new use?'. The implication of this starting point is that all existing uses are more important than the new use, without regard to the number of people being served by the alternative (bus, taxi, car or truck).

As parking stress increases, municipalities are likely to consider the use of space in a more empirical and economic manner. This is already occurring in parts of Sydney and Melbourne where pedestrian space is being increased (based on evidence related to the economic contribution of that space). Some municipalities (initially the City of Sydney) have commenced undertaken this type of economic analysis related to car share services, but they are yet to apply that logic to the manner in which they determine access to car parking spaces.

Over time, municipalities will tend to understand that a successful car share network needs to have:

- Enough nodes (or locations) to serve the area (network coverage or reach)
- Adequate vehicles (numbers and types) at each node to meet customer needs
- Minimal nodes where usage levels are below the threshold to be financially viable (unless Council is willing to subsidise services in these locations).

The locations will be designed in relation to each other and be placed neither too close or too far apart. This decision will be based on a catchment measure that reflects distance and convenience of access.

Table 18 compares application of these criteria for a bus network and car share network.

TABLE 18: SERVICE NETWORKS

| CRITERIA | CAR SHARE | BUS SERVICE |
|---|---|---|
| This is an appropriate area for the service | Suitable population density<br>Level of alternative mobility choices | Suitable population density<br>Inside Urban Growth Boundary |
| Service coverage | 90% of the target population has convenient access to a car | 90% of the target population has convenient access to a bus stop |
| There is convenient access to the service | 90% of houses within 150 – 200m of a node | 90% of houses within 400m of a bus stop |
| The service is available | Types of vehicle<br>Hours of operation<br>Public access (if cars are inside apartments) | Frequency of service<br>Hours of operation<br>DDA compliance |
| The service is reliable | Number of cars at each node to match customer demand | Punctuality<br>% services operated |
| Amenity | The location is and feels safe | The location is and feels safe |

*Source: PBA Analysis*

It is worth noting that the car share industry in Australia and local government engagement with it are both still 'coming of age' and will take many years for deep understanding and sophisticated management to evolve. This is very similar to the evolution that street railways (trams) went through over a century ago within initial efforts hampered by highly restrictive 'rules'. For example, only once municipalities understood the economic and social benefits of such technology did they remove initial rules that required a 'flagman' to walk in front of each vehicle to warn pedestrians that a '*new fangled contraption*' was approaching.

### Car share nodes

An efficient car share network design considers the nodes in relation to each other – not too far apart, not too close together – giving the network a spatial character similar to other public transport networks.

In an effective network all the users will be in reach of at least one node. Figure 22 shows the area within a 500-metre walk of a car share vehicle (orange dot) in Carlton Melbourne. Another car has been placed at the purple dot. In this case the network has a vehicle-to-vehicle distance of 500m. The users living between the two vehicles will be within 250 metres of a car which is beyond the rule of thumb catchment radius of 150 – 200m.

FIGURE 22: EFFECTIVE CATCHMENT OF CAR SHARE VEHICLE


*Source:* *PBA Location: Carlton Melbourne Orange dot Lygon & Faraday Streets. Purple dot Carlton & Barkly Streets,*

The nodes in some areas of the City of Sydney have been placed much closer than in the example above. The example from Surry Hills shown in Figure 23 below highlights that the City of Sydney network has distances between the vehicle nodes (shown by orange dots) ranging from 65m to 229m with an average of 132m.

FIGURE 23: CAR SHARE NETWORK DETAIL, SURRY HILLS SYDNEY

*Note:* *Block bounded by Elizabeth, Foveaux, Wellington, and Devonshire Streets Surry Hills Sydney*

*Source:* *Nearmap with PBA Analysis*

Ideally the locations will be at intersections to increase the effective catchment of the node. All of the vehicles except one (the red dot) in the example above are at intersections.

In addition to pedestrian access the network design should take into account land use intensity. Figure 24 shows how the catchment of a node can be compromised, in this case, by locating it near parkland.

FIGURE 24: COMPROMISED CATCHMENT OF THE PURPLE NODE


*Source: Nearmap with PBA Analysis*

Returning to the Surry Hills example in Figure 23 the mid block node (red dot), can be removed without compromising the accessibility of the network. Without that location, the average walking distance goes up to 166m – still an acceptable walking distance.

Critical to the success of any transport network is reliability. In the case of car share services this means that most users can get access to a car of their choice at most of the time they would like to. This means that each node must have enough cars (and types of car) to cater for customer demand. In general as usage rises, additional cars will need to be added to the nodes. The application of this approach is prevalent in Australia as illustrated by Surry Hills in Figure 25 below.

FIGURE 25: VEHICLES AT EACH NODE


*Source: Nearmap with PBA Analysis*

## 7.4. ALLOCATING KERBSIDE SPACE

Car share networks in Australia are predominantly based around kerbside nodes of one to three vehicles. These kerbside locations reflect the location of the overall parking supply – most inner city residential car storage occurs in on-street (kerb-side) spaces. Off-street parking is available, though tends to be used by commercial tenants, commuters or residents within newly completed apartment buildings.

During the start up phase kerbside parking spaces have been the easiest place for service providers to locate the cars as they are under the direct control of Councils. At that time there was little reason to consider other locations as the networks were small and the impact on the available space was low.

At the start of the service few other locations were available. Unlike European municipalities, local government in Australia have not built off street parking for residential vehicle storage and the era of private sector risking significant financial capital to build residential car parking is over. In general the new parking supply is in private buildings and is only available to building occupants.

The decision to use kerbside locations has supported the growth of the networks:

- Kerbside locations are popular with car users whether they are owners or 'renters'. Even car owners in outer and middle suburbs with off-street parking often prefer to leave their vehicle on the street. In Australia, car share vehicles parked at the kerb are 20% more popular with users than those based inside structures.
- From the car share users point of view, kerbside space is not only more convenient it can be an important feature of the service. An inner suburban resident may have to spend some time searching for a suitable parking space whereas a car share user has access to a dedicated parking space.
- On-street parking nodes increase awareness of the service and contribute to the recruitment of new users.

Kerbside space has a number of other advantages when growing the service:

- Municipalities have plenty of kerbside space. The City of Sydney has a total of 160,000 parking spaces, or about 1.75 spaces for every vehicle owned by local residents.[73]
- The additional capital cost of the kerbside space to Councils is zero. The only cost or (benefit) to Council is in the opportunity lost or gained by its use. Because neither the municipalities nor the service providers need to pay high construction costs (there is some cost to marking the bays), the networks have been able to grow more quickly.
- Kerbside space is available everywhere within the municipality. This has enabled Councils and the services to locate vehicles near the users, which has helped drive the growth of usage.

Experience suggests that kerbside spaces are fundamental to the growth of the service:

- Where most of the network – as in the City of Sydney – has been located at the kerbside then the usage has grown strongly
- When the number of kerbside spaces is not increased, growth in membership and use tends to stagnate
- Where the network has been constrained (by Councils refusing or constraining supply of new nodes) to off street locations – such as in the City of Stonington and the City of Brisbane – growth is very slow and benefits to the community are suppressed.

### Permission

Australian Councils that endorse the deployment of car share services in kerbside locations have followed similar 'permission' processes. Some have added car share to the categories of defined use[74] (alongside bus stops and disabled parking) and car share vehicles have been allocated exclusive access to a number of kerbside parking spaces.

This approach has subtly changed how a parking space for a defined user group can be used. The other defined uses, loading bays for example, serve many people by cycling multiple vehicles through one space. In the case of car share each space serves many people by placing one vehicle in the space. It is also different to a space at the front of a single dwelling – which residents may perceive to be for their exclusive use. This change has given rise to some criticisms discussed below.

### Rate of deployment

Although Councils have followed the same permission process they have adopted different rates of deployment of the service in kerbside locations. The different rates have a direct implication on car share services available to the community. The impacts are more sharp because car share service providers need to evaluate the risk/reward profile of operating in each municipality – and this evaluation tends to be based on ease with which each service provider feels they can grow the network and any costs and risks associated with that growth. The impacts can be grouped into four categories of policy setting seen in Australia:

- Suppression. Some Councils have refused to allocate any kerbside space to car share vehicles (which would be used by local residents and businesses). This type of policy contradicts the typical Council policy setting relating to residential parking. Some Councils have imposed special conditions on car share vehicles in particular locations for example asking service providers to remove vehicles from streets where there are no parking controls, even though a resident owned car that is used less frequently and serves fewer residents can be parked at any time.
- Capping. Some Councils have rationed the number of additional kerbside spaces provided each year. The number of spaces in the ration is unrelated to the number of existing users, growth in user numbers or the activity levels of the vehicles. Rationing enables Councils to suppress the growth of the service in practice without directly imposing a ban.
- Application based. Some Councils have an expansion policy based on applications. Generally these are Councils that see the growth of the service (rather than the regulation) as the responsibility of the service providers. As noted above, this can lead to poor network design. In theory this approach would allow the network to grow at the rate that the service provider can acquire users and cars. In practice the expansion rate is slowed by lengthy permission processes and high levels of refusals. It is the most common approach to date (although this seems to be changing) and is symptomatic of Councils that are supportive but not determined to maximise network growth or service to the community.
- A monthly ration. The fastest growth rate has been achieved by the City of Sydney. This Council has identified suitable kerbside space and offered it to the service providers in a timetabled expansion of ten spaces a month. This has had the impact of guaranteeing a minimum expansion rate. However, this approach has also constrained the growth of the service. The quota of ten spaces each month has always been taken up by one or more of the service providers and there have been months when the service providers collectively would have deployed more than ten vehicles. (Recently the monthly ration has been reduced to 4 spaces per month.)
- Market rate expansion. An even faster rate of expansion can be imagined. If a Council were to establish a consensus with a neighbourhood, suburb or the whole municipality that car share services were advantageous to non-users and users, and if the Council and community

agreed broadly where the nodes in the network would be sited, then the service providers could be encouraged to add vehicles into the network at the rate which they could afford. This 'market rate' expansion would be a reflection of recruitment and use and would avoid people being denied access to the service due to 'monthly rationing'.

In general the position a Council takes on deployment reflects the strategic framework that has been agreed. Councils that see the service as necessary or relevant have followed the path of expansion or response. Councils that see the service as a low priority or unnecessary have rationed or suppressed the supply of kerbside space. There are currently some municipalities in which policies are shifting between Rationing, Response and Expansion usually reflecting the level of understanding amongst local politicians (councillors and electoral candidates).

Most Councils however are slow to release bays. This has reduced growth in the network and constrains the growth of the user base. Typically these delays are related to internal processes that are often delayed (due to their low priority), sometimes for months. Delays are exacerbated when Councils require new locations to be considered at a Council meeting which elevates a procedural decision to the policy makers. These delays also impose costs on the service and its users.[75]

For these reasons it can be said that in Australia many local governments effectively set car share policy and strategy through their bay allocation processes. Indeed most municipalities do not have formal policies regarding car share services, including some of the capital city councils.

## Problems with allocating kerbside space

Many of the problems that Councils have implementing car share strategies (and many of the problems that car share services experience in their partnerships with Councils) relate to the allocation of kerbside space to the service. The various sources of these are discussed below.

### More people in less space

Parking management in inner city municipalities is more challenging than it has ever been. The supply of kerbside parking space in inner areas has reached its peak but the population and resident vehicle fleet continues to grow. In this context it is not surprising that the allocation of kerbside spaces to prominently marked car share vehicles has been contentious.

Generally local governments are using legacy processes and systems (that evolved from when there was abundant supply) to manage kerbside space. One symptom of this is that managers often issue more permits than can be met by the supply. Parking managers (as well as residents and local businesses) resist changes to allocation of space and advocate for increases in supply. There is often a reluctance to implement demand side measures such as allowing prices to rise (or fall) to reflect demand. Alternative modes and alternative solutions are dismissed on the invalid assumption that 'everyone travels in (or needs) a car'. Particularly in inner city areas, Australia residents and bureaucrats are becoming more aware of the fact that most people in urban (not suburban) areas would prefer to (and do) walk to local facilities as much as possible.

Pre-scarcity management tends to be reactive, localised and vulnerable to the exertion of influence and special interests. Priorities can preference incumbent users and uses over new ones. Sampling techniques are used for monitoring and enforcement. In this context it can be difficult for parking managers to prioritise car share vehicles, even if they want to.

The management of scarce parking resources requires a more rigorous and empirical approach that includes:

- Clear strategic goals
- A detailed knowledge of the extent of the supply

- Time and cost controls that reflect the strategy
- Definitions of use and priority setting for best value
- Demand management measures to reduce pressure on supply
- Close monitoring of all spaces use against specific measures
- 'Unavoidable' enforcement.

Ideally a scarcity-based system through which all kerbside space users compete based on their economic value would be implemented. In such a context the allocation of space for car share vehicles would be more straightforward. It is also likely that other benefits would be gained by such an approach.

### Capping

In Australia, managers of kerbside parking space tend to develop concepts that exclude or reduce the impact of new users in order to protect the status quo. This mainly occurs because it is convenient and expedient but is also influenced by local political realities. In places where the local community understand the value that can be generated by reallocating the kerbside space, some Councils have been able to extend pedestrian areas, install bike corrals, increase vegetation and expand the space available for public transport, taxis and loading.

One of the most remarkable responses to the increased pressure on kerbside space has been to consider 'capping' the number of car share spaces. It is not surprising that Councils think in terms of 'caps' as much of their time is spent designing and enforcing 'floors' and 'caps' including those related to:

- Risk and health: speed limits, patron limits
- Amenity: noise limits of venues and for pumps, patron limits
- Access: time limits in toilets, book limits at libraries,
- Capacity or capability: Wi-Fi download limits, patron limits, load limits on roads.

These are easy to implement ways in which to minimise the impact of unconventional users. They are logical because for the most part unconventional users impose negative impacts on the local community (consider overdue library books, speeding drivers and heavy vehicles). The flaw in the case of car share services, is that the service have a net positive impact on the surrounding community in terms of easing parking stress and reducing congestion. Capping growth on car share services is therefore akin to applying early fees to people who bring back library books early, or fining drivers for driving more carefully.

The rationale for a cap in many Australian municipalities seems to be that 'the cap will ensure that residents have access to limited kerbside space'. If this is the idea behind a cap it suggests the proponents:

- See the car share vehicles as 'additional' cars rather than representing a reduction in car ownership
- Do not understand that the people who want to use the car share vehicles are residents and local businesses (all ratepayers) – while individuals using parking are not necessarily ratepayers
- Do not understand the range of benefits (economic, environmental and social) that flow from car share networks to the local community.

There are other more useful constraints that can be put on car share vehicles. The most important is to performance manage the service to ensure that all kerbside car share vehicles are 'active' as described below. Performance management of the vehicles:

- Supports the service today by weeding out inactive vehicles and triggering additional

deployments to increase capacity where (and when) required

- Can be used today to show that the vehicles are 'earning their space'
- Can be used in future when a more rigorous regime is brought in to manage all users of kerbside space.

### Space management and revenue raising

The allocation of kerbside space in Australian municipalities is often affected by the dual role of the manager who is typically sets the parking policy, procedure, collects revenue and also manages parking enforcement. These multiple roles are given different levels of priority in each municipality. However it is fair to say that each requires a specific set of skills (and often different methods of thinking). There are rare examples of people who have fully developed all these skills and can readily switch between high level policies and day to day enforcement activities (and do them all exceedingly well).

From the perspective of managing parking scarcity and congestion, fees (and time limits) are a means by which use of the space (and economic returns to the community) can be optimised. The 'parking' revenue is a by-product of the management system. However in local governments in Australia the primary role of managing a scare resource – kerbside space – is often obscured by the political implication of charging users for the space (both political aversion to fees and political addiction to a fairly inelastic revenue stream). In the City of Sydney parking meter revenue accounts for 7% of annual income.[76]

When the 'revenue raiser' role becomes more important than the role of space manager, the manager has a tendency to view any loss of 'earning space' as something to be prevented. However in most municipalities due to the political intervention in setting car parking fees, the subsidy for car drivers parking is typically over 50% (that is Councils collect less than half the revenue they would earn if the fees were charged at a market rate).

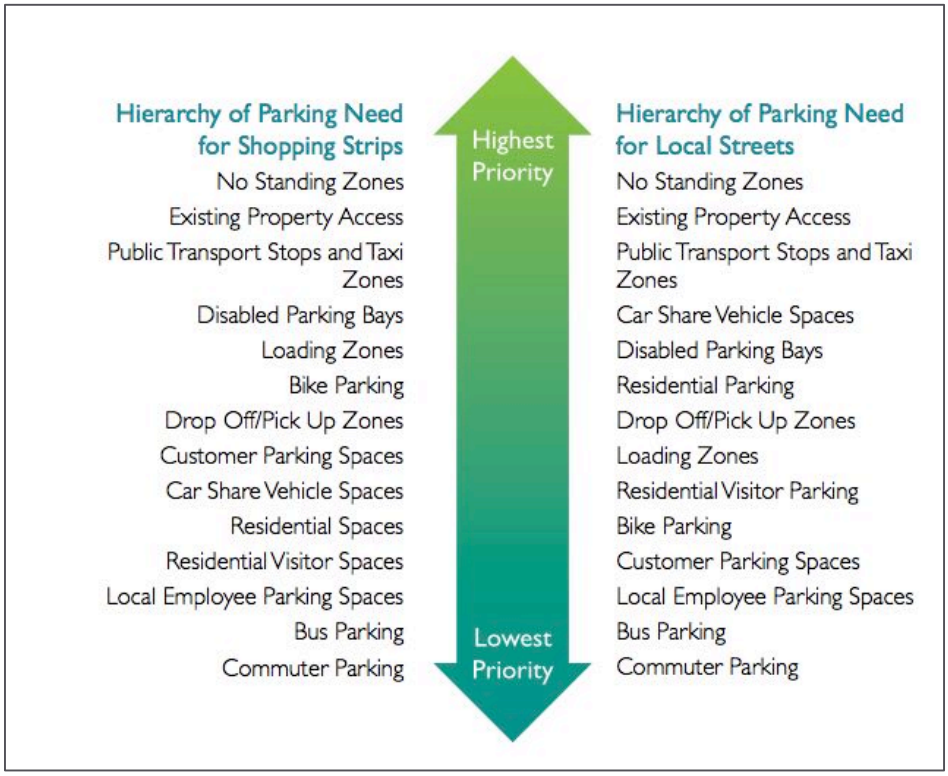
This problem is exacerbated when, as in a number of municipalities, the task of managing the car share service has been given to the parking manager. This tasking makes sense operationally, as the parking space manager is the one who has to act if kerbside space is to be set aside for a new type of user group. However, there is a risk in giving responsibility for a mode-shift or car ownership reduction program to a parking manager as there is a fundamental mismatch between their role raising revenue and other elements of Council's typical policy suite (which would seek to reduce that revenue by discouraging car ownership and use).

This problem can be overcome by a strong high level strategy and support from key senior staff and a strong strategic direction. This support will enable the parking manager to make what will be seen as controversial 'parking decisions' to support the growth of a car share network even if the decisions appear to compromise their role as the 'revenue raiser'.

### Usage hierarchies

Australian local governments have made a step towards managing limited space against strategic priorities by establishing hierarchies of kerbside access. The earliest example was a hierarchy developed by Currie and Tivendale in 2007. Figure 26 shows a typical example from the City of Port Phillip.

FIGURE 26: HIERARCHY OF PARKING NEEDS - CITY OF PORT PHILLIP SUSTAINABLE TRANSPORT PLAN




*Source:* *City of Port Phillip Parking Strategy*

The hierarchies provide guidance but they are not internally or externally enforceable because they do not sit within a strict scarcity management system that allocates the limited amount of kerbside space to the highest use.

Strict interpretation of hierarchies, such as the one above, would be problematic because:

- There are more than two types of street. Street character can be ambiguous or multifaceted. Inner city streets can include retail shops, detached residences, apartment buildings, large businesses and car parking businesses.
- The role of the car share vehicle is not always the same. Typically, a car share vehicle supporting residential use would not sit in a meter that supports a shopping strip. This is reflected in the City of Port Phillip hierarchy. However, the City of Sydney car share policy aims to support small businesses by locating vans. This is probably why as shown in Figure 27 a car share van has been located (right hand side) amongst the meter parking that supports the retail strip. (The loading zone is around the corner to the left of the picture).

FIGURE 27: CROWN STREET, SURRY HILLS, SYDNEY

*Source: PBA Photo*

### Kerbside space in CBDs

Councils have taken different approaches to kerbside space in CBDs. Over time the kerbside space available for parking motor vehicles is being replaced by other uses such as:

- 'Car free areas' such as Bourke Street Mall in Melbourne and Pitt Street Mall in Sydney
- Wider footpath areas
- Public transport lanes, stops and layover areas
- Bicycle lanes
- In some areas of the Sydney CBD parking and footpaths will be removed to increase the number of travel lanes for motor vehicles.

This results in a steadily shrinking amount of kerbside parking spaces to be allocated for various uses. Complicating matters in most Australian urban areas is the fact that population and commercial activity is growing in almost all of them. Indeed in many, the scale and rate of growth will significantly exacerbate existing levels of local traffic congestion and parking stress.

The City of Sydney has resolved the car share issue in the CBD by not allocating any on street parking to car share services. The City of Melbourne has provided 21 spaces and is preparing to increase that number. Both approaches have some merit:

- The case for excluding car share from on street spaces in the CBD is that a parking space that has a high turnover – averaging around 5.5 uses in a day – which can facilitates many high value transactions. In a CBD this high turnover may produce a greater economic benefit that a car share space that is likely to support 6 hours of car use each day.
- The case for including car share in CBDs is that CBDs are not entirely homogenous. Not all areas support high-value car based transactions and not all spaces have high turnover rates. Therefore excluding car share from such high value spaces need not mean a ban from parking space throughout the entire CBD.
  In addition, CBDs typically have high levels of residential and commercial activity and car share vehicles can significantly reduce the cost of living and doing business in the area. The wider shared economy is going to become critical to improving efficiency of business districts where agglomeration generates higher activity levels and congestion.

Users certainly support the deployment of car share vehicles in CBDs. Within Melbourne CBD, car share vehicles in on-street locations are used 20% more than comparable vehicles parked in nearby off-street spaces.

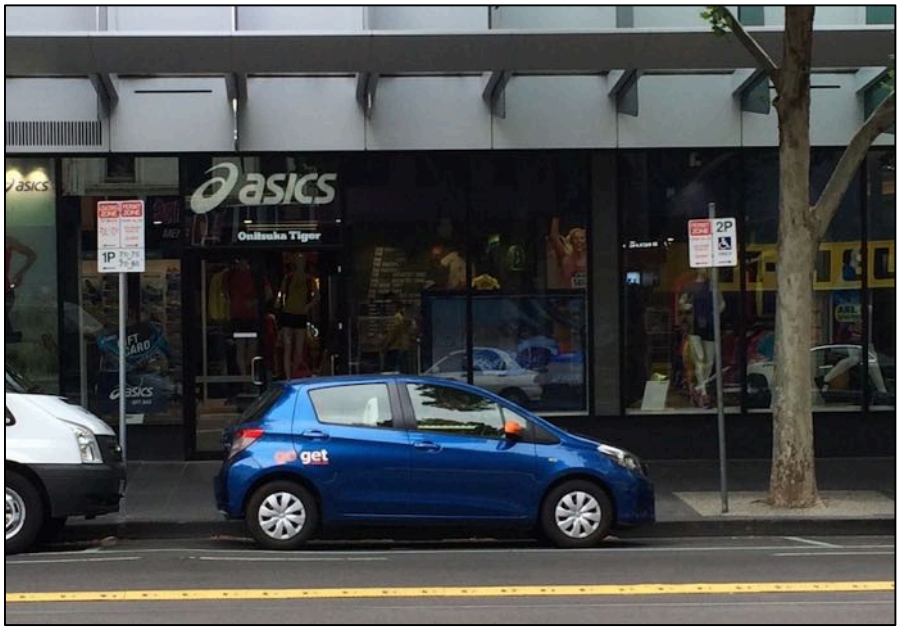
## Meter parking in retail shopping strips

The argument against car share vehicles in shopping strips is based on a perception or assumption, particularly by shop owners, that shops stay in business in direct proportion to the quantity and price of parking in the immediate vicinity.

This perception is not always based on evidence. Nonetheless the nexus between users of car share vehicles and a specialist retail stores is low – neither helps the other. Figure 28 shows a car share vehicle in front of a specialist retail store in Melbourne. It is unlikely that the car is generating any business for the specialist store or that the specialist store is supporting users of the car.

The specialist store needs a high turnover of specialist customers. A typical car space in a retail environment with a 1 or 2 hour time limit caters for 5.5 cars per day. Car share vehicles on average do not cater for that number of people, and the people using the car share vehicle are not using the vehicle to access specialist retail facilities.

FIGURE 28: A CAR SHARE VEHICLE PARKED OUTSIDE A SPECIALIST RETAIL SHOP FRONT




*Source PBA*

On the other hand a car share vehicle based in or near a local shopping centre adds to the services available in that neighbourhood centre. A local shopping centre with a chemist and a newsagent will be more 'attractive' than one without those services. Similarly, a local shopping centre with car share will also be more attractive as people will be able to fulfil more of their needs in one place. In this case, although people may not be using the car to access local facilities they are likely to use local facilities when they go to pick up or return the car.

The benefit to the local businesses should also be considered. The value to a small business of access to a car share 'white van' that avoids of the high cost of ownership and the significant inconvenience of parking their own van can be significant.

## High mobility streets

There is unlikely to be a strong case for placing car share vehicles on high mobility streets such as those that have:

- Bus Lanes (at any time of day)
- High pedestrian volumes (making future footpath extensions likely)
- High demands for loading vehicles.

However, there is good reason to locate car share vehicles close to transport 'hubs' that are on some of these high mobility streets. In these instances the car share vehicles can be located in a side street close to the specific transport hub.

## 7.5. LEVERAGING OFF-STREET SPACE

One way that Councils can expand a car share service without taking up kerbside space is to develop off-street locations. In most municipalities the proportion of the network deployed off-street is less than 20%. It is likely that an effective network could be developed where up to 70% of locations were off street. This opportunity has been missed (or not taken) for a number of reasons:

- Strategy: Municipalities have not realised that they are the mode manager and or have not they realised the potential value of a strong car share service.
- Scale: The current or future size of the car share network has been underestimated and therefore the necessity for off-street locations has been overlooked.
- Regulation: Councils have not had the support of the planning rules until recent changes in NSW to some Development Control Plans and Local Environmental Plans. Municipalities in Victoria still lack this support in the planning ordinance.
- Barriers: Councils and the car share services still face 'in practice' barriers that prevent vehicles from being placed in buildings. Car share service providers will not usually put vehicles in a building where only building occupants can use them. Even if these spaces were filled, they would not contribute to the wider network.
- Cross-divisional barriers inside Councils: statutory planners have been unfamiliar with the service, have not seen the connection to other Council policies or have focused on the current rules rather than looking for negotiated opportunities.

The service providers have made some attempts to locate vehicles off street:

- A number of developers are using car share to reduce the cost or increase the value of buildings. Figure 29 shows what is claimed to be the only two-bedroom development in Australia without any car parking. This architect prequalifies the purchasers and sells the apartments before construction.
- Car share service providers have been successful retrofitting cars into existing buildings. Figure 30 and Figure 31 show 'retrofit' sites one in a hotel car park and one at the base of an office building.
- Service providers also pay for vehicles to occupy spaces in commercial car parking garages. Figure 32 shows vehicles in a Council parking structure while Figure 33 shows off street parking leased from commercial operators.

Unfortunately these opportunities are at the margins and have not made a significant impact on the size of the networks available.

FIGURE 29: THE COMMONS BRUNSWICK


*Photo: PBA Photo*

FIGURE 30: A PUBLICLY ACCESSIBLE CAR SHARE VEHICLE ST KILDA ROAD PRECINCT

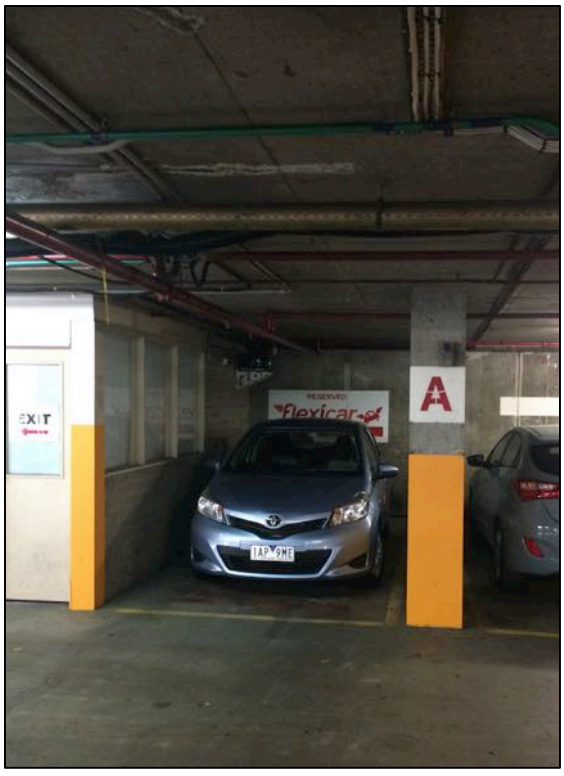


*Photo:* *PBA Photo archive*

FIGURE 31: A PUBLICLY ACCESSIBLE CAR SHARE VEHICLE WITHIN A BUILDING ENVELOPE

*Photo:* *PBA Photo archive*

FIGURE 32: CAR SHARE VEHICLES AND SPACES IN THE CITY SQUARE CAR PARK, MELBOURNE

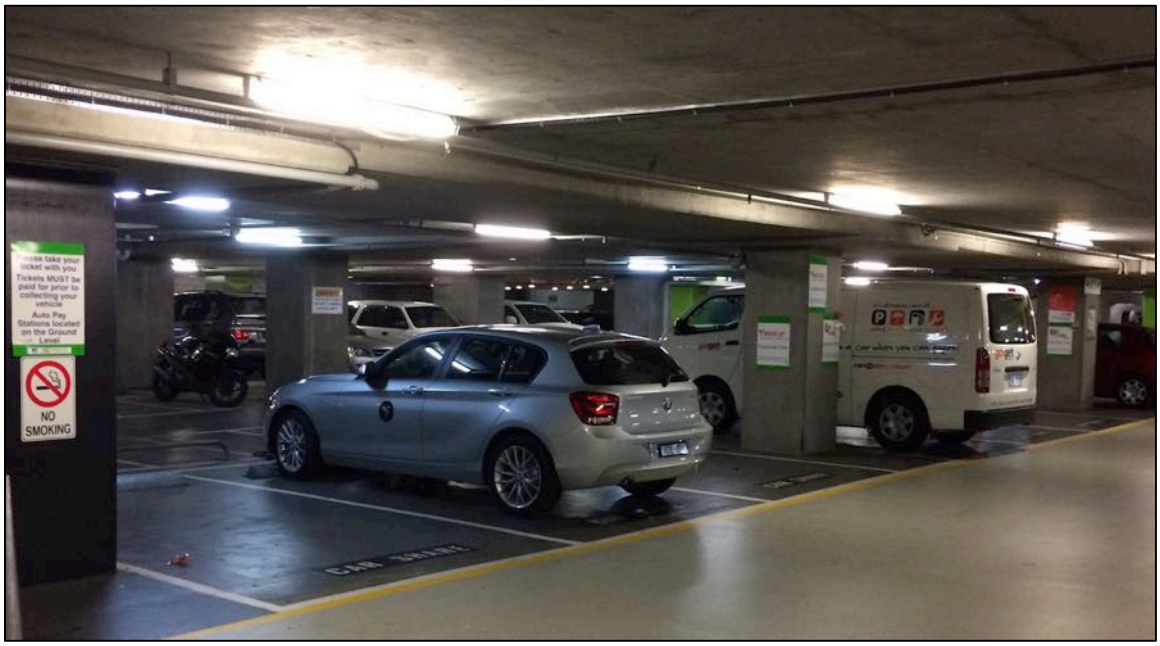



*Photo:* *PBA Photo*

FIGURE 33: CAR SHARE VEHICLES IN A COMMERCIAL CAR PARK MELBOURNE CBD

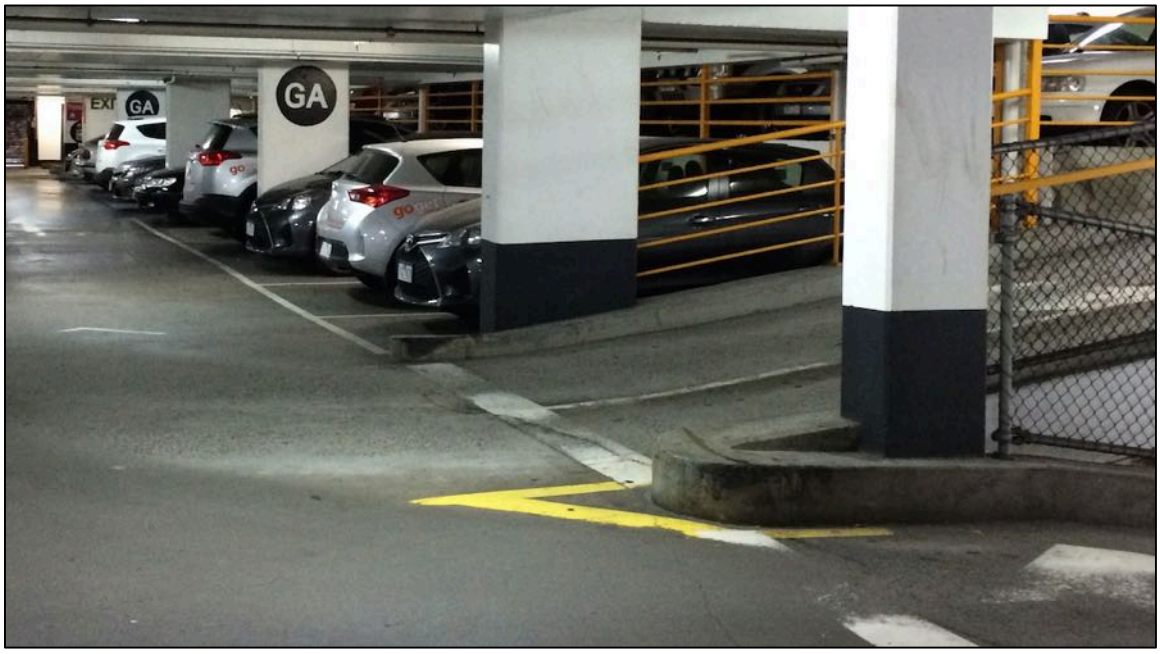



*Photo:* *PBA Photo*

FIGURE 34: OFF STREET AT GRADE PARKING IN THE CITY OF MORELAND


*Photo:* *PBA Photo*

Councils such as the City of Melbourne have responded to the intensification of land use by providing kerbside space near new apartments. Figure 35 and Figure 36 show a typical inner suburban and CBD fringe apartments with their related car share vehicles.

FIGURE 35: CAR SHARE OUTSIDE AN APARTMENT IN CARLTON MELBOURNE

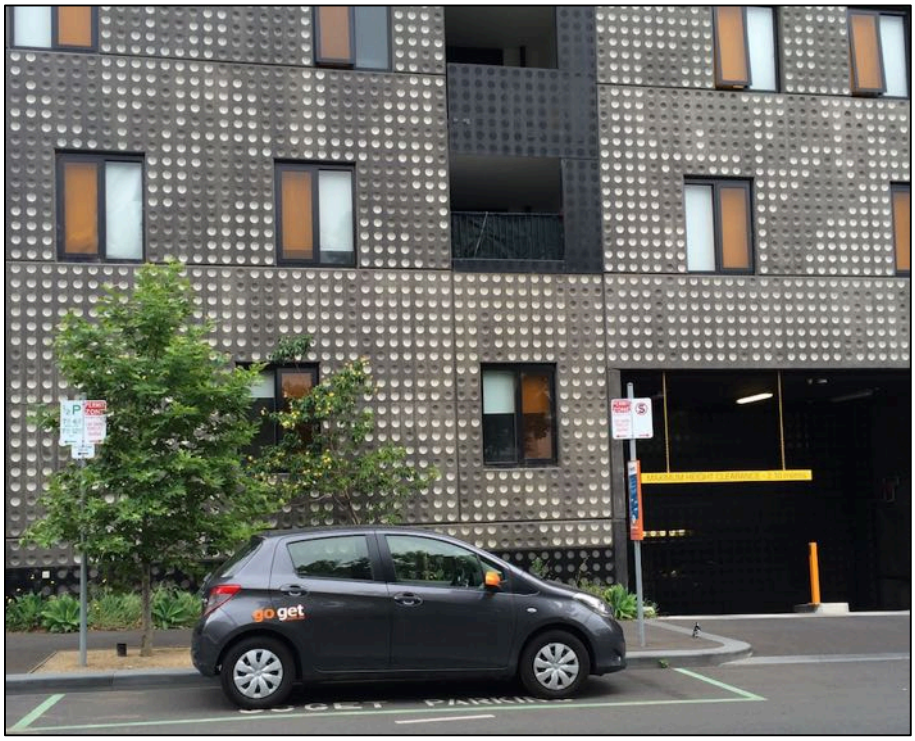


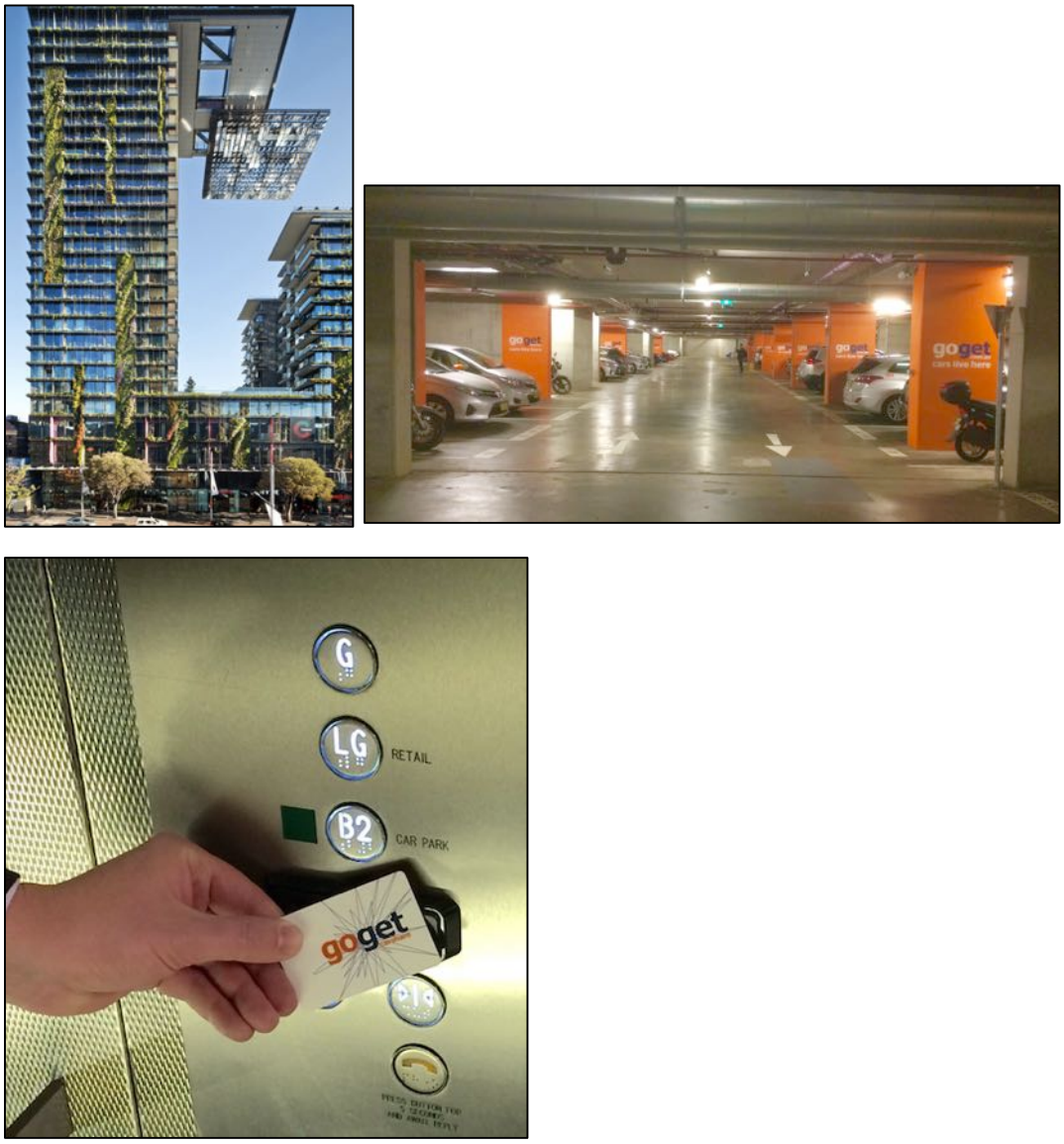

*Photo: PBA Photo*

FIGURE 36: CAR SHARE OUTSIDE A CBD FRINGE APARTMENT MELBOURNE


*Photo: PBA Photo*

There are more than sixty publicly accessible car share vehicles in the Central Park Apartments in Sydney as illustrated in Figure 37 below.

FIGURE 37: CENTRAL PARK APARTMENTS, CHIPPENDALE, SYDNEY




*Sources: PBA Photos and Architects Impression*

Access to these cars is not included in the body corporate fees. Car share members without access to the building can still gain access to the cars. When a booking is made the users car share card is activated to permit the non-resident to enter the building car park to reach the car share vehicle.

## The limitations of off-street locations

From a network design point of view, off street locations are inflexible. It would for example be difficult to design a network based entirely on off-street locations that provided coverage and reliability across a municipality because:

- Not all buildings have space to park cars on the land and not all areas have buildings where cars can be parked
- It is difficult to enrol the owners and users of existing buildings
- Opportunities arise when new buildings are being designed and passing through statutory planning procedures but new buildings are not spread evenly over the municipality. (Where access can be gained to an existing or planned building the technology exists to provide an

'open system' where the non-occupant user can gain access to the vehicle.) It is necessary to ensure that off-street locations have a strong mobile data signal to enable the booking, door opening, vehicle location and other functions to operate.

- The network is not enhanced if a 'closed system' or occupant-only car share vehicle is installed. (Generally the service providers will not support this type of location, as vehicles do not attract enough use to pay for the costs).

From a system growth perspective car share services find it harder to compete with ownership when the vehicles are in off-street locations:

- Users prefer the convenience of kerbside access. Given a choice between two closely located vehicles the kerbside car will be chosen more often.
- Off street access supports use but a kerbside location both supports use and encourages people to join the service
- Off street locations can be unattractive and inconvenient. Figure 30 shows a car in an undersized bay (which would make it difficult to park) in an unattractive basement car park.
- Off street locations are sometimes closed at night restricting the operating hours of the service.

A small number of Councils have restricted car share services to locations on private land and in private buildings. This approach has slowed the adoption and use of the service and consequently reduced the size of the community benefit.

Table 19 sets out the competitive advantage and disadvantages of car parking locations.

TABLE 19: TYPES OF PARKING SPACE AND THEIR ATTRIBUTES

| LOCATION | POSITIVE | NEGATIVE |
|---|---|---|
| On-street median space | • Proximity to users & ease of access<br>• Visible to user community<br>• Minimises cost of service provision<br>• Likely to be less contested by others | • Outdoor will require more car cleaning |
| On-street kerbside space | • Equivalent (perhaps better) than local resident parking (ease of access)<br>• Visible to user community<br>• Minimises cost of service provision | • Outdoor will require more car cleaning<br>• Often contested by other users |
| Off-street at grade space | • Easier to access (& drive-away) than other off-street locations | • Typically a low amenity environment<br>• Short term only as site likely to be developed |
| Off-street multi-deck space | • Undercover results in less cleaning<br>• Easier to organise maintenance | • Increases cost to customers<br>• Less convenient (to access and drive-away)<br>• May be closed at night |
| Off-street underground space | • Undercover results in less cleaning<br>• Easier to organise maintenance | • Increases cost to customers<br>• Less convenient (to access and drive-away)<br>• May be closed at night<br>• People least prefer parking underground |

*Source:* *PBA Analysis*

## Council initiatives

Councils are responding to the opportunity of off-street car share locations in a number of ways. The most effective means of increasing the number of nodes in off street locations is to leverage the planning scheme. Councils have considerable influence over the planning schemes and how they are negotiated and implemented.

### Strengthening the planning scheme

The City of Sydney and the State Government of NSW have worked over a considerable period to improve the planning context. In December 2006 the City of Sydney defined the parking principles for Green Square around the idea of lower (than average) car ownership and use including living well without a car in an area with provision of high quality public transport, walking and cycling networks. [77]

The Sydney Local Environmental Plan 2012 sets maximum rates for car parking in buildings in order to 'minimise the amount of vehicular traffic generated because of proposed development.'

The Sydney Development Control Plan 2012 included a clause (3.11.2) that defined the provision of car share spaces.[78] These rules allow car share spaces to be provided in addition to the maximum number of car parking spaces permitted in the development as well as setting minimum rates of car share provision. The car share spaces must be held in common by the Owners Corporation be for the exclusive, use of car share and be located together in convenient locations and available to the public at all times. The required rate of car share vehicle provision is higher than the equivalent code in San Francisco. In this respect the City of Sydney is leading world's best practice and is one of the few Australian municipalities to have a requirement for car share spaces in new development.

Some Councils have included the requirement of space for 'closed car share systems' in their planning scheme. In a closed system the vehicle or vehicles are only available to the residents or occupants of a building. These provisions have not had any measurable impact. By definition a closed system has no positive impact on a wider network so these provisions have not helped or hindered the growth in use of the service. In general closed systems do not generate enough revenue to make the vehicle financially viable. For this reason the service providers will only operate a closed system with a minimum revenue guarantee. No Councils have agreed to subsidies for closed systems and none have required them of owners corporations.

### Negotiations

Even in areas where the planning scheme is not explicitly in favour of car share Councils have considerable opportunity to negotiate parking dispensation, waivers and trade offs that can influence the growth of the car share network.

### Related initiatives

It is not only the planning schemes and related negotiations that will need to be adapted, the expectations and understandings of incumbent residents will need to change. Early apartment developments in inner areas tended to increase the number of vehicles parked at the kerb. Today most inner municipalities do not issue kerbside permits to residents of what is called in the City of Sydney 'restricted buildings'.

Alongside this exclusion the concept has grown up that each building should be 'self sufficient' in parking. Existing residents concerned to avoid increased competition for kerbside parking interpret 'self sufficient' as 'more than enough'. This expectation is not necessarily reflected in the planning scheme, which allows trade offs and apartments without car parking. But when the

expectation influences planning decisions it makes it harder for Councils to include car share and car parking trade offs.

Car share service providers should consider partnering with other transport providers to offer standard 'welcome packages' for developers to provide to new apartment purchasers. These could include public transport passes, bike share membership, arrival and car share memberships – more advanced options could include infrastructure within the buildings such as real time transport information screens.

### Pressuring the service providers

Some Councils want the car share service providers to increase the number of off street locations. The City of Melbourne recently required the service providers to find one new off-street car space for every on-street car space provided by Council. It is unlikely that the service providers will have the influence in the area of planning that a Council lead initiative would have. Therefore this type of requirement is likely to be inefficient and lead to increased user costs (as a result of red tape) that exceed the cost of Council using its considerable influence to gain the same outcome.

This is a slightly perverse situation whereby a Council will be indirectly increasing the cost of services to its community by making a private sector provider do something that the Council has a much greater ability to accomplish (at a lower cost). It highlights an aspect of the evolution of the car share sector in Australia illustrating how the mode managers (local government) are not currently taking a holistic approach to their 'mode manager' role and are trying to push responsibility for some mode management tasks onto the service providers.

## 7.6. INTEGRATION

Successful development and implementation of an expansionary car share service strategy involves consideration of:

- Transport planning – mode share and trip targets, mode and user priorities
- Sustainable transport – integration with public transport, bicycle and walking networks
- Traffic engineering – parking bay sizes, set backs, road speeds, local area traffic management
- Kerbside space management – proportion and location of kerbside nodes, permits
- Parking enforcement – policies and procedures
- Urban planning – controls and requirements
- Public health – facilitation and partnerships related to active transport
- Social planning – support for low income car access
- Council fleet – management and staff transport support
- Communications – internal and external awareness raising and marketing.

Few Australian municipalities have implemented processes that reflect the cross divisional inputs needed to deliver a holistic strategy for car share services (regardless of the policy intent). Finding a typical internal 'home' within the municipal bureaucracy for car share to 'champion' the community service is a critical step that many Councils need to achieve.

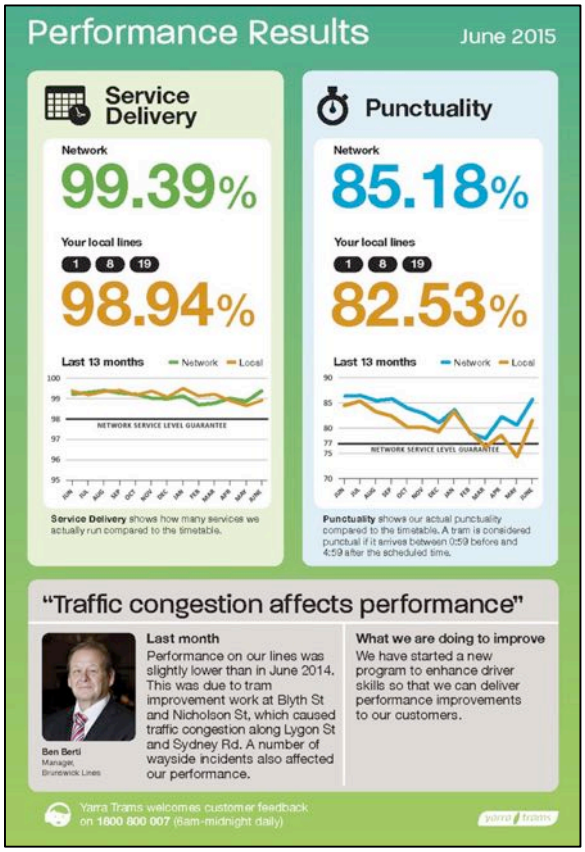
## 7.7. PERFORMANCE MANAGEMENT AND REPORTING

Most Australian municipalities require the service providers to provide regular reports. These typically require significant detail about membership, fleet size and usage rates. They tend to be required on a quarterly basis.

Councils receive these reports from a number of providers and consolidate them when analysis of the data is required. Because of the format the reports are received in and because the various service providers use slightly different metrics this is a time consuming exercise. As a result the service is not monitored closely or reported frequently to Councillors and the general public

In this respect the mode management of car share services is well behind that of other public transport modes. This can be contrast with the performance reporting required of public transport franchisees illustrated in Figure 38 below.

FIGURE 38: YARRA TRAMS (MELBOURNE) MONTHLY PERFORMANCE REPORT




*Source: Yarra Trams*

Up until now no Australian municipality has produced regular reports on the community benefits derived from the service. Table 20 shows some of the metrics that could be used in such a report.

TABLE 20: POSSIBLE CAR SHARE SERVICE PERFORMANCE MONITORING

| TARGET | FUNCTION | POSSIBLE SETTING |
|---|---|---|
| 'Motorisation rate' | Strategic KPI | Number of vehicles per 100 residents |
| Resident vehicle ownership target | Strategic KPI | Total number of cars stored in the municipality |
| Service targets | Management, performance and reporting | Resident population membership rate<br>Network coverage<br>Service reliability |
| Service benefits | Communicate benefits and costs | Private cars avoided<br>VKT avoided |

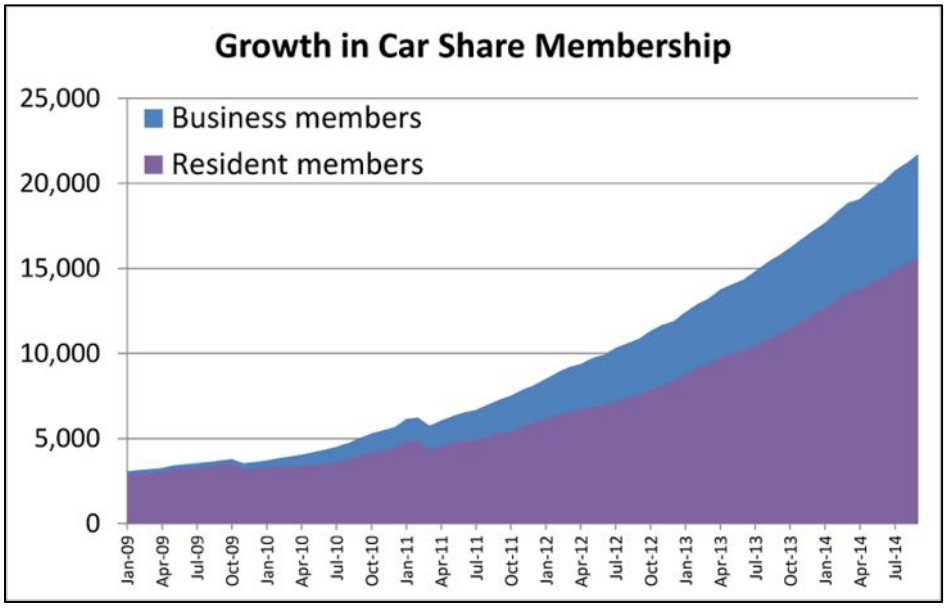
*Source: PBA Analysis*

## Monitoring User numbers, car numbers

The current City of Sydney policy uses 'enrolments' (membership) as a means of measuring the strategic impact of the car share service. This is then communicated to the public via the City's website. The City of Sydney are providing leadership regarding the monitoring of car share services and communication with their constituents amongst Australian municipalities, however there is significantly more that can be done to get closer to world's best practice. Achieving this will require a deeper partnership between the municipality and the service providers – similar to that found between mode managers and public transport franchisees (such as in Melbourne).

An example of the monitoring is the growth of car share membership in the City of Sydney is shown in Figure 39 below.[79]

FIGURE 39: SYDNEY: GROWTH IN CAR SHARE MEMBERSHIP

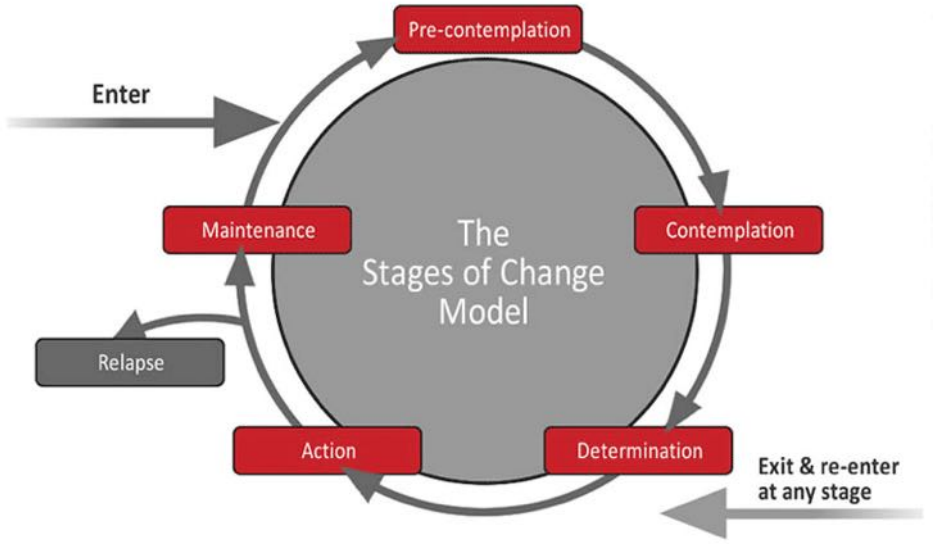



*Source: City of Sydney website: http://www.cityofsydney.nsw.gov.au/live/residents/car-sharing*

Understanding the 'stages of change'[80] illustrated in Figure 40 that individuals go through will help both mode managers and service providers to fully comprehend how the services are performing and how the community is responding to them. Consideration should be given to

how this model might influence what other metrics should be monitored (from a service provider or municipal perspective).

FIGURE 40: PROCHASKA AND DICLEMENTE'S STAGES OF CHANGE MODEL




*Source: Johnnyholland.org*

Membership is not always a reliable measure of community value derived from reduced ownership and use:

- People may belong to a service without using it even if it is convenient and available
- People may belong to a service and not be able to use it if the locations are not convenient or cars are not available

Similarly the number of vehicles in the network is not a reliable measure of value derived from reduced ownership and use. For example:

- A philanthropist or a long-term investor might provide a network in which there was a car share vehicle for each member – reducing many of the values of the service. Here supply is greater than demand.
- When a Council suppresses the growth of the service, this 'forces' people to remain as car owners. In this case demand is greater than supply.

## Key performance indicator: vehicle activity

A more reliable way of measuring the impact of the service is 'vehicle activity'. This measure can be used to track both the strategic impact of the service and to manage poorly performing aspects.

A typical usage band used by the service providers is between 3 – 6 hours a day. When a car share vehicle is used more than 6 hours a day, some latent demand is likely to exist and usage is suppressed. This typically occurs when too many members are trying to use too few vehicles. When usage is below 3 hours a day the car is not active enough to be financially viable.

'Vehicle Activity' is a useful measure because it is these vehicles that have an impact on ownership and use. It is a reliable measure because it directly measures customer payments rather than user intentions or memory.

It is a useful measure for the mode manager who can relieve overused cars by allocating more space (making sure that people who want to use the service can do so) and can remove insufficiently active cars that are taking up space that could be used for other purposes.

## 7.8. TAXES AND CHARGES

This section considers the practices and concepts used by Councils when considering taxes and charges on car share services in Australia. Taxes and charges are important because they directly or indirectly impact on the:

- Relative cost of car ownership and 'car services'
- Behaviour of users
- Scale of the network
- Community benefits able to be achieved.

Alongside space allocation, taxes are the most powerful tools that Council has to influence the community benefit derived from a car share service.

It is worth noting that most Councils do not conceptualise fees and charges as 'taxes'. It is true that some payments required of car share service providers are passed directly without profit (or loss) to third party service providers. For example, some Councils use third party providers to apply pavement paint.

If the definition of a tax is a charge that shapes behaviour or influences a market then most of the payments made by car share service providers are taxes – whatever the intention of the Council. This point is critical as Councils – for whatever reasons or perceptions – are influencing the decisions that people (and service providers) make about car share by requiring payments. Councils have to weigh up the implications of the payments they require from car share service providers as they affect the uptake and availability of the service – just as cigarette taxes directly affect levels of use.

An indication that some payments required by Councils are levys rather than 'costs' is when a Council incurs no additional costs for an activity, using an in-house line marking team for example, yet charges for that work. Councils that use the money raised from the car share service for other purposes also demonstrate that they are not 'out of pocket' directly but have found a 'revenue raising' opportunity.

This section considers the charges that are applied by Councils and considers their intent alongside their actual impact.

Currently some Australian municipalities do not charge any fees while others charge an upfront or annual fee typically on each vehicle in a car share network.

It is unclear how these practices became established. It is likely that charges were imposed because car share services looked like the sort of thing – a parked car or a business – that Councils typically imposed charges on. Where charges are not imposed it is probably because car share services look like the sort of community service – a library or community bus – that Councils do not normally impose charges on.

There was no opposition to the fees in the early days of the service probably because the service providers were concentrating on becoming established while users, who were few in number, were insulated from direct awareness of the fees.

Some Australian municipalities have moved car share services from one category to another. When car share schemes were first introduced to Australia the City of Melbourne helped

establish Flo Carshare, which became Flexicar, with a grant of $25,600 alongside other grants from the Victorian Government and private sector. Recently the City of Melbourne made the decision to increase fees on all car share vehicles[81] and they now expect annual revenue of $245,000 from the service providers. Ultimately this fee will be borne by users, all of whom are local ratepayers and the strategic impact of the tax will be felt by all residents.

The charges that Councils apply are usually attached to a concept or rationale such as 'establishment' and 'infrastructure' fees. Over time these concepts have become embedded in standard practice. The most common of these concepts are discussed below.

## The impact of taxes and charges

It is generally true that taxes and charges affect the price of services, which in turn influences people's behaviour especially where they have alternatives. This is because when a tax or charge is imposed on a service, the service provider passes-on the increase in a cost to the customer.

Some Australian Councils have applied taxes on service providers without understanding the impact on their own ratepayers and the wider community benefits derived from the service. Proponents of this view argue that the car share service provider will 'absorb' any taxes or charges without passing them on. At the moment for car share services in Australia it is certain that any additional fees and charges will be passed on to the users because:

- There is a competition between operators (particularly with regard to customer pricing and value).
- Car share operators are not distributing profits, rather they are making losses or reinvesting profits into additional fleet growth.

Australian municipalities do not have a consistent way in which taxes and charges are levied against car share service providers and therefore the service providers are bearing different financial burdens in each municipality. At this stage service providers tend to equalise the impact across their entire business (particularly since the expensive parking spaces tend to be in the most lucrative locations). Over time, as municipal variations have greater impact on business productivity car share service providers will need to be more transparent in passing-on taxes and charges that apply in specific areas to the ratepayers of that municipality (and not spread them across the broader membership).

The taxes or charges applied by Councils have a direct impact on users' behaviour, and through this on the scale of the service. Recent changes and new 'reasons' for charging also pose a significant financial risk for service providers in Australia. To some extent this increased risk has an impact on resources required at each service provider and by itself increases the cost to serve each customer.

When the price of transport services rise, people use the services less. Generally a 10% increase in public transport price causes use to fall by 3-5%. For car share users and potential users the 'reduction in patronage' is felt as follows:

- The higher prices reduce the perceived (and actual) difference between the cost of ownership and the cost of 'services'.
- The higher prices increase the cost of a car share trip for existing users. This reduces the number of trips made and makes car ownership more attractive especially for those that have high levels of use of car share services.

These 'patronage reductions' flow back to the service provider as follows:

- Because usage is reduced, revenue from existing users goes down
- To cut costs the vehicles with low levels of usage are likely to be withdrawn
- Existing users may then find that there are no conveniently located vehicles and may reduce

their use of the service or even leave

- Recruitment of new users will be affected by the increased price and by the withdrawal of the vehicles.

In short, higher prices create a negative feedback loop causing the service to shrink back to a scale that can be supported at the new price. Modelling shows that even a modest charge by Council reduces the available car share network to the community and in some instances can result in a complete withdrawal of service. This impact can be observed in Brisbane where the service is only available in commercial car parks. The commercial car park fees have raised the cost per hour to users. This has suppressed the growth of the service in users and vehicles relative to other centres. Currently there are only eight vehicles available in Brisbane, fewer than in Adelaide.

## Cash today or community benefit tomorrow

Assuming they are well informed, any bureaucrat recommendations and Council decisions about taxes and charges effectively mirror the 'actual' strategic view of car share services:

- A Council that does not want the service to expand (or even exist) will impose taxes and charges to that end. This mechanism is used by the Federal Government to simultaneously raise money from and suppress smoking. In the transport domain 'time based tolls' are used on the Sydney Harbour Bridge in a similar way to reduce demand in peak periods.
- A Council that wants the service to expand will minimise taxes and charges and instead provide subsidies. Mode managers running public transport services use subsidies in order to deliver the community benefit from an effective public transport network. Australian Councils routinely subsidise transport services such as community bus services, parking in retail areas, bike share networks and public transport (through access to kerbside space).

The direct relationship between the scale of the service and taxes and charges means Councils can choose between financial revenue or community benefit. The more revenue they decide to extract from the ratepayers that use the service, the less community benefit will be generated.

The economic model allows us to how municipalities reduce the community benefit of the service in favour of increased annual revenue. From an economic point of view it is a perverse decision. Modelling shows that any revenue gains by a Council will directly result in a loss of community benefits. That is $10,000 of revenue to the City of Sydney from the service will represent a $60,000 loss to the community.

The confusion between cash today and benefits tomorrow has lead to other perverse outcomes. Some municipalities are cross-subsidising other 'sustainable transport initiatives' from fees on car share users. This would only be rational if the 'other sustainable transport initiatives' had a higher benefit cost ratio higher than car share services. This practice is at-odds with the high level of benefit that car share networks provide (compared with other sustainable transport initiatives).

Interestingly in Australia, some politicians (Councillors) have pointed out – on the public record – the absurdity of this situation. The impact of not collecting the revenue generated by car share taxes amounts to only a few cents per ratepayer and seems to be more symbolic rather than a truly necessary charge.

## Concept: Establishment fee

In some municipalities fees are framed as 'establishment fees' that recover costs incurred by Council during the installation of a designated car share bay.

The costs of establishment are real. In general each car share parking bay is marked by pavement paint and signs. Bicycle parking may also be installed. In some exceptional situations there may be other costs including construction of the car space.

The costs are lower (per vehicle) if there are more vehicles in the location; no bicycle parking is provided and less pavement paint is used. Figure 41 shows a defined area for two vehicles in the City of Melbourne with no formal bicycle parking. The image on the right (City of Sydney) shows more expensive infrastructure for one car. Note the larger area of pavement paint is required in the City of Sydney to reduce the use of a vacant bay by private vehicles.

FIGURE 41: CAR SHARE PARKING INFRASTRUCTURE - CITY OF MELBOURNE (LEFT) CITY OF SYDNEY (RIGHT)

*Source: PBA Photos*

Each car space requires maintenance. Typically, line marking and signage will last for around 10-20 years and the pavement could last longer. Signs can be vandalised or broken in crashes. Pavement paint needs to be refreshed based on the amount of wear it receives.

However, municipalities in Australia do not charge 'establishment fees' for any of the other defined uses of kerbside space such as taxi ranks, loading bays or bus and tram stops.

These other defined uses occupy considerably more space than the car share network in any Australian municipality. In the City of Sydney the car share network occupies around 3% of the available kerbside space and is used in some areas by 20% of the residents. Currently in Melbourne CBD around 1% of the Council's on-street parking spaces are allocated to car share service providers while 5% are allocated to bus service providers and 10% are allocated to use by taxi service providers.

Nor are establishment fees charged to users of timed parking bays or charged separately to users of meters or in resident permit zones.

This creates an interesting topic for discussion related to fair treatment of competing service providers. Specifically the car share service providers are competing with private vehicle ownership. In Australia many motor vehicle sales companies use the kerbside space in front of their establishment for either parking new cars, as a loading zone or for customer parking. No municipality charges any of these retail companies for the use of the space or for establishing infrastructure to manage the space effectively.

## Concept: 'Cost recovery' fee

Some municipalities such as the City of Melbourne charge car share services for an impact that they perceive the service has on parking meter revenue. The City of Melbourne refers to this as a 'cost recovery fee'. This term implies that a cost has been borne by the Council and that the fee seeks to recover it.

The 'cost recovery' argument uses an attractively simple argument:

- We have placed car share vehicles in spaces that we previously had parking meters
- Our meters produce an average (or specific) amount of revenue each year
- Therefore the car share service providers should pay for the revenue we have 'lost'.

The syllogism is misleading because the purpose of the kerbside space is not considered. Meters are removed for many reasons when there is a better use for the space. If a meter is removed for a bus stop, bicycle lane or kerb outstand no Australian municipality requires a compensatory payment.

The syllogism ignores the fact that meter revenue relies on effective space management techniques not on the number of meters.

Effective space management is usually defined as maintaining an occupancy of 85% or having 15 empty bays out of 100. When the occupancy falls and there are more empty spaces, then parking meter rates can be lowered 'to attract more use'. When the occupancy rises and there are not enough empty spaces then the meter fees should be increased. The aim is to maintain a proportion of empty bays to allow drivers to easily find a parking space easily. In other words it is the bank of one hundred meters (including the fifteen empty ones) that earn revenue not any one particular meter.

Ineffective space management will mean that there are too many empty bays (usually because the price is too high) or too few (usually because the price is too low). In either case the total revenue will be reduced. The space manager's job is to set the price for the space that maintains it at the desired occupancy. The revenue comes as a by-product of price and demand not from the number of meters.

As long as there are empty metered parking spaces, then a small number of car share vehicles can be added without affecting parking meter revenue. Three car share vehicles (3%) can be added to area of one hundred meter parking spaces leaving 12 (not zero) spaces available for other users. This would lift the occupancy to 88%. New arrivals will park in one of the twelve empty bays and no meter revenue will be lost.

Modelling showed that in order to maintain the desired occupancy rate (reduce occupancy back to 85%) the Council could increase the parking fee. In the specific case analysed the increase in fee required would be $0.17 per hour. Applied over the same area served by car share network this would raise an additional $2m per annum. Clearly this would be a better way of recouping any lost revenue – netting ten times the amount that taxing the service providers would and spreading the cost over users of parking (not just the few residents choosing not to own a car).

Even if there was revenue lost as a result of car share, and revenue was set as the primary goal, then it is possible to turn timed bays into meter bays or raise the price on the remaining two and half thousand meters[82] in order to maintain revenue.

By accepting the cost recovery argument and levying a tax on the car share service, the City of Melbourne set the car share strategy towards suppression of the service.

Another factor is in operation in the City of Sydney where parking meter charges apply for people who do not have a resident permit. The impact of car share services is to reduce the number of resident cars, which in turn makes more meter spaces available for non-residents. This has not been modelled but would act to increase the Council's revenue.

## Concept: Resident parking permit

Many Councils in Australia have residential parking permit schemes (particularly in inner city areas). Where permit schemes are in place Councils charge a resident permit fee for the car share vehicle.

It is reasonable to charge a residential permit for a car share vehicle when all other private vehicles in the area are being charged the same fee.

It is not reasonable to charge more for the car share vehicle. The idea has been suggested that every user of the service should pay for a permit. This shifts the concept of the fee from a 'vehicle' permit to a 'driver' permit. This approach has two logical flaws:

- The scare resource that is being managed (to some extent) by the parking permit fee is the kerbside space not the driver. There is no need to try to reduce the number of drivers in a particular area by charging for a resident driver permit.
- It is unreasonable for the 'multi-driver' vehicle to be taxed more than the single driver vehicle. Such a variation would be perverse, encouraging the least intensive use of the space.

The impact of charging more for the car share vehicle is to raise the cost of 'car services' against the cost of car ownership – disadvantaging the former and favouring the latter. Few Councils have adopted strategies and policies that would support that approach.

## Concept: Mode manager fee

Given that the practice of charging fees for car share vehicles has become widespread the question is whether there is any justification for any type of fee. There are appear to be two situations in which a fee would be defensible from a strategic point of view as well as being helpful to Council and the service providers.

One concept that has some value is the mode manager fee (discussed above in the economic model). Councils have an argument to charge a fee to the service as the State Government charges a fee to the taxi services it manages.

There is no doubt that Council time is taken up managing the development of the car share service. There are strong reasons why Council should contribute this time without charge, (as it typically does for management of the bicycle and pedestrian networks) especially if by doing so the Council can contribute to growth of the service and increase of community benefits.

There may be Councils however that do not want to constrain the growth of the service but do want the service provider to be seen to 'make a contribution'.

This could be done through a mode management fee that met the following criteria:

- Low enough not to cause a price increase that reduces the scale and use of the service
- No greater than the actual cost of managing the service – this would depend on the scale of the service and the rate of growth desired by the strategy
- Based on a per vehicle payment except for:
  - Newly deployed vehicles until a certain time passes or a certain usage rate is reached

  - Vehicles provided to ensure equity of access to services (such as in low income areas)
- Charged annually in arrears (rather than a larger fee at a greater interval) and set for a defined period that reflects the financial return on investment (public transport franchises are efficient when awarded for a 7 year period with a 5 year optional extension).

## Concept: Payback periods

Australian local government are relatively mature when it comes to contracting service providers in a range of industry sectors including garbage collection, leisure centre operation, public transport provision (typically community buses) and park maintenance. With each of these services the contractor typically invests in staff and capital infrastructure necessary to provide the service.

The payback period on this investment (and the bidding process) varies from service to service. Contracts need to have a long enough life (more than the payback period) otherwise competition is stifled and the quality of contractor bids (and their pricing) suffers in order to mitigate against the risk that they won't be able to pay back their investment.

In the case of Australian car share services, neither the service providers nor municipalities yet have a mature enough understanding of the payback periods. This is because network growth is the core focus and a period (several years) of stable use is required in order to fully understand the necessary payback periods.

It is worthwhile considering best practice applied to other transport modes. In Melbourne and Sydney many of the State managed public transport services are tendered out to franchisees for periods that total 15 years. These contracts typically consist of a seven year initial period with an optional five year extension that can be exercised if the service quality expectations are being met.

This would be a reasonable starting point in terms of reducing the risk associated with access to specific parking spaces. This would ensure that car share service providers have adequate time to recoup (and generate a return on) their financial investment in each vehicle. The optional extension from seven to fifteen years will create an incentive for service providers to meet government expectations in terms of service quality.

As local government starts to implement these best practice measures in Australia, it will be important for service providers to highlight that in the case of this type of service there is no benefit from wholesale change of service providers in any specific area. This is because members will vote with their wallets and service providers that are not performing adequately will not be able to remain financially viable. This means that only around 15% of the spaces allocated to car share service providers needs to be placed into a contract in any given year. If Council seeks to reallocate a space from one service provider to another, the Council would essentially be stripping some residents of 'their' chosen service provider. This will be problematic if it occurs across a large network and the remaining vehicles are unable to cater with the customer demand that remains.

## Concept: Not charging fees

There are strong arguments why Councils, as mode managers, should not charge the users and providers of the car share network. Charging car share services is inconsistent with other behaviours of Council, for example:

- Councils support services that directly benefit ratepayers. The availability of a car borrowing service benefits ratepayers, particularly residents. This is similar to a book borrowing service provided by a library.

- Councils support initiatives that generate wider public benefits. The increased use of car share services not only benefits the users but the wider community who do not contribute to the network establishment or service operating costs except through the Councils contribution. Other services in this category include public toilets, street rubbish bins and New Year's Eve fireworks – all of which support local businesses and the amenity of residents and visitors.
- Council facilities such as aquatic centres are often operated by a private entity, charge users a fee and also receive a subsidy from ratepayers. The subsidies are necessary because without the subsidy the service would not be financially viable.

Charging car share services is inconsistent with Councils transport and land use strategies:

- Councils do not charge users of other modes that they are trying to encourage (particularly in order to reduce car ownership and use) such as foot traffic and bicycle use
- Mode managers routinely subsidise public transport. Some Councils run their own community bus services paying the operator and providing free access for users
- Mode managers of public transport often subsidise modes to ensure that the service can be delivered equitably across a given geographic area
- Councils do not charge for many defined kerbside space users. No fee is charged for bus stops, taxi ranks and loading bays.

By supporting car share services Councils avoid having to run the service themselves. The service providers offer municipalities a remarkable and rare chance to gain benefits without direct capital investment and with the users paying for the service.

# 8. Conclusion

This report considers the current state of the car share sector in Australia. It discusses the likely economic impacts of the services and some of the current issues facing the sector with specific regard to partnerships with local government.

The model suggests that for the current service:

- Each car share vehicle in the network is estimated to represent $60,000 in value (net) to the City of Sydney community:
  - The total benefits of each deployed vehicle, including reduced congestion and improved road safety, are estimated to be $71,000
  - The annual costs of each deployed vehicle to the community, including the opportunity value of the area of kerbside space and the mode management, maintenance and administration costs to the City of Sydney, are estimated to be $11,500
- The City's support of the service delivers a return of $6.16 for $1 of investment
- The total net annual benefit to the community of the current car share network of 805 vehicles is $48 million.

Looking ahead to 2021 the model considers three scenarios:

- Capping the service at the current level of vehicles and expecting the resident vehicle fleet to grow by 22% to 76,000 vehicles by 2021
- Growing the service at the established rate of 10 vehicles a month until it reaches 1,600 vehicles in 2021. In this scenario the resident vehicle fleet will grow by 10% to 6,000 vehicles
- Strategic expansion of the service enough to avoid any increase in the number of resident vehicles based in the City of Sydney. In this scenario there will be 2,300 car share vehicles and the resident vehicle fleet will remain at 62,000.

The following values were identified:

- Capping the network at around 1,000 car share vehicles: The annual net benefit provided by the service will be around $59.7m
- Growing the network to around 1,600 car share vehicles: The annual net benefit provided by the service will be $95.5m
- Strategic expansion to a network of around 2,300 car share vehicles: The annual net benefit provided by the service will be $137.2m.

PHILLIP BOYLE & Associates

# Appendix A: Detailed calculations for the economic assessment

## OVERVIEW

| A: Assumptions | Unit Rate (adjusted 2014) | Unit Rate | CPI Adjustment | Year of Unit Rate | Unit | # Note/ Reference |
|---|---|---|---|---|---|---|
| Members per Car | 24.15 | 24.15 | | | Members per Car | |
| Reduced Car Ownership | 0.52 | 0.52 | | | Cars avoided per Member | 1 |
| Percentage parked off-street | 0.58 | 0.58 | | | Car spaces avoided per Member | |
| Reduced Car Ownership Cost | $993.66 | $775.00 | 28.2% | 2005 | Car avoided | 4 |
| VKT Avoided per Member | 1,947 | 1,947 | | | VKT avoided per Member | |
| Reduced air pollution | $0.0124 | $0.0121 | 2.8% | 2013 | VKT avoided | 5 |
| Reduced greenhouse gases | $0.0066 | $0.0064 | 2.8% | 2013 | VKT avoided | 5 |
| Reduced noise | $0.0030 | $0.0029 | 2.8% | 2013 | VKT avoided | 5 |
| Reduced impact on soil / water, biodiversity, nature / landscape, urban barriers | $0.0116 | $0.0113 | 2.8% | 2013 | VKT avoided | 5 |
| Decongestion | $0.2249 | $0.2070 | 8.6% | 2011 | VKT avoided | 6 |
| Road Safety benefit | $0.0485 | $0.0400 | 21.3% | 2007 | VKT avoided | 7 |
| Reduced car usage cost | $0.1618 | $0.1618 | 0.0% | 2014 | VKT avoided | 8 |
| Additional time spent walking | - 0.00433 | - 0.00433 | | | Hours per Member / Week | |
| Additional time spent cycling | - 0.00974 | - 0.00974 | | | Hours per Member / Week | |
| Net Health benefit of additional walking (assumes 5 km/h) | $7.82 | $7.20 | 8.6% | 2011 | Extra Hour Walked | 9 |
| Net Health benefit of additional cycling (assumes 15 km/h) | $12.22 | $11.25 | 8.6% | 2011 | Extra Hour Cycled | 9 |
| Opportunity Cost of Owning Car Space | $4,716.00 | $4,716.00 | 0.0% | 2014 | Car avoided | 10 |
| Community value space | $9,206.81 | $9,206.81 | 0.0% | 2014 | On-Street Car Park Used for Car Share | 12 |
| Cost of Signage, Implementation and Linemarking to designate a Sha | $1,900.00 | $1,900.00 | 0.0% | 2014 | On-Street Car Park Used for Car Share | |
| Administration fee | $450.00 | $450.00 | 0.0% | 2014 | On-Street Car Park Used for Car Share | |
| On-street parking permit | $52.00 | $52.00 | 0.0% | 2014 | On-Street Car Park Used for Car Share | |

| # Note/ Reference | Note/Reference |
|---|---|
| | GoGet, Hertz/Flexicar, GreenshareCar membership and vehicle data |
| 1 | PBA analysis of deferred vehicle purchase, 2015 GoGet Survey Data |
| | PBA analysis of deferred vehicle purchase, 2015 GoGet Survey Data |
| 4 | Australian Transport Council 2004, *National Guidelines for Transport System Management in Australia: Volume 4 Urban Transport*, Australian Transport Council, p 56. |
| | PBA analysis of VKT before and after car share, adjusted by factor impact of car share. |
| 5 | Austroads 2014, *AustRoads Tehcnical Report AP-T285-14: Updating Environmental Externalities Unit Values*, Austroads, Table 6.1. |
| 5 | Austroads 2014, *AustRoads Tehcnical Report AP-T285-14: Updating Environmental Externalities Unit Values*, Austroads, Table 6.1. |
| 5 | Austroads 2014, *AustRoads Tehcnical Report AP-T285-14: Updating Environmental Externalities Unit Values*, Austroads, Table 6.1. |
| 5 | Austroads 2014, *AustRoads Tehcnical Report AP-T285-14: Updating Environmental Externalities Unit Values*, Austroads, Table 6.1. |
| 6 | Department of Infrastructure & Transport 2013, *Walking, Riding and Access to Public Transport: Supporting Active Transit in Australian Communities*, Commonwealth of Australia. |
| 7 | ARRB 2007, *Road Safety Risk Reporter Issue 7*. Crash Cost Rate for Urban Roads. |
| 8 | RACV 2014, Vehicle Operating Costs (Light Cars): Toyota Yaris 5dr running costs. |
| | (Average Minutes per Trip) x (Additonal Trips). Department of Transport 2010, Victorian Integrated Survey of Transport & Activity (VISTA) 2009-2010, Victorian Government. GHD 2010, City of Melbourne Car Sharing Research, Appendix G: Car Sharing Members Survey. |
| | (Average Minutes per Trip) x (Additonal Trips). Department of Transport 2010, Victorian Integrated Survey of Transport & Activity (VISTA) 2009-2010, Victorian Government. GHD 2010, City of Melbourne Car Sharing Research, Appendix G: Car Sharing Members Survey. |
| 9 | Health benefit minus injury costs multiplied by speed - Department of Infrastructure & Transport 2013, *Walking, Riding and Access to Public Transport: Supporting Active Transit in Australian Communities*, Commonwealth of Australia. |
| 9 | Health benefit minus injury costs multiplied by speed - Department of Infrastructure & Transport 2013, *Walking, Riding and Access to Public Transport: Supporting Active Transit in Australian Communities*, Commonwealth of Australia. |
| 10 | Annual Repayment of a 30 year CBA Home Loan equal to the value of an average Sydney Car Parking Space ($73,000).Findacarpark 2014, *Park it and pay*, Sydney's average car park sale price of $73,000. Commonwealth Bank of Australia, *Home Loan Calculator* |
| 12 | Real Estate & Car Park market research. |
| | Email Correspondence, CoS (5/8/2015) |
| | Email Correspondence, CoS (5/8/2015) |
| | Email Correspondence, CoS (5/8/2015) |

| B | Vehicles | | | | |
|---|---|---|---|---|---|
| Car Share in City of Sydney | On-Street | Floating | Off-Street | Total | Rate |
| GoGet | *572* | *1* | *155* | *728* | 21.28 |
| Hertz | *45* | *0* | *7* | *52* | 55.29 |
| GreenShareCar | *25* | *0* | *0* | *25* | 43.08 |
| ***Total*** | *642* | *1* | *162* | *805* | ***24.15*** |

PHILLIP BOYLE & Associates

# Assumptions

| F | | Source | Note |
|---|---|---|---|
| **Cost of Car space** | **Per Car Space** | | |
| | | | |
| *Method 1: Creating a liveable live space* | | Department of Transport, Planning and Local Infrastructure 2013, Creating Liveable Open Space -Case Studies July 2013, p 16. | |
| Project cost (Errol St North Melbourne) | $5,000,000 | | |
| Project area (in square meters) | 4,371 | | |
| Cost per square meter | $1,144 | | |
| | | | |
| Car space (2.5m x 6.0m) | 15 | Clause 52.06 Car Parking - Port Phillip Planning Scheme | |
| The cost of a car space | $17,159 | | |
| | | | |
| *Method 2: Urban forest amenity value* | | City of Melbourne, Making a Great City Greener 2012-2032. Urban Forest Strategy 2014, p 22 | |
| Melbourne's urban forest amenity value | $700,000,000 | | |
| Trees population | 70,000 | | |
| Tree value (cost of a car space) | $10,000 | | |
| | | | |
| Tree value (40cm diametre at breast hight tree = 1 car space) | $11,706 | Greening Port Phillip: An urban forrest approach | |
| Tree = 15 sq meters | | | |
| | | | |
| *Method 3: Car Park Research* | | | |
| Contemporary car park values (lease price p.a) in the City of Sydney | | | |
| Cost of a car space | $3,427 | PBA analysis on leasing prices for car spaces (http://www.parkhound.com.au, Oct 2015), | |
| | | | |
| *Method 5: Real Estate Research* | | | |
| Contemporary site values (lease price p.a) in the City of Sydney | | | |
| Cost per square meter | $302 | PBA analysis on leasing prices for industrial/retail/commercial sites (http://www.realcommercial.com.au, Oct 2015), | |
| | | | |
| Car space (2.5m x 6.0m) | 15 | | |
| Cost of a equivelent car space | $4,536 | | |
| | | | |
| **Cost of a car space** | ***$9,207*** | Average of methods. | |

# Appendix B: June 2012 Economic Analysis

In 2012 the City of Sydney completed an economic analysis of car share services in the municipality. This has been used to inform the current model and this report, however there are several noteworthy differences that help to explain the differences between the two model outputs. These differences largely result from updated and more current information, five years of network growth and slight variations in unit rates due to different research being used.

The most significant difference is the approach to valuing the reduction in private vehicle costs (which accounted for 80% of the benefits identified in the 2012 analysis). The more recent analysis takes a more conservative approach to this aspect and financial savings from car purchase accounts for around 30% of benefits in the 2015 model.

Table 21 and Table 22 below compares the models used by the Benefit-Cost Analysis of Car Share within the City of Sydney Final Report City of Sydney June 2012 with the current report.

TABLE 21: COSTS

| ITEM | 2012 (SGS) | 2016 (PBA) | COMMENT |
|---|---|---|---|
| | **Costs** | | |
| **Planning and administration costs** | $26,000 a year (0.25 EFT of Band 7 employee) | $450/parking space each year | Varies from Council to Council and according to network size and growth rate |
| **Infrastructure and maintenance** (Conversion costs) | $889 per space | $1900 per space | The surface area of bays in City of Sydney is painted. In other areas a white borderline is used. Includes signage & line marking Includes 0.5 EFT staff & maintenance of pavement & signs |
| **Foregone parking revenue** | $1,356 each year | $0 | (See 'opportunity value' below) |
| Increased congestion on public transport | Not quantified | Not accepted | See discussion in report |
| **Opportunity value of a car park space** | Not mentioned | $9,000 a year | Kerbside space has many valuable uses apart from parking and car share. |

*Source: SGS 2012 & PBA Analysis*

TABLE 22: BENEFITS

| ITEM | 2012 (SGS) | 2016 (PBA) | COMMENT |
|---|---|---|---|
| **Benefit of reduced car parking occupancy** | Not mentioned | Not Included | Car parking occupancy is reduced as the residential fleet is reduced |
| **Car park purchase avoided** | Not mentioned | $3,312 a year/cars avoided | Every car that is purchased need to be stored somewhere |
| **Car ownership costs avoided** (Deferral of car purchase savings) | 50% buy a $20,000 vehicle and 50% buy a $10,000 vehicle and paid off over five years at $3,000 a year/cars avoided | $1,000 a year/car avoided | PBA estimate reflects on-road rather than capital costs avoided Accounts for all on road costs including finance. |
| **Running costs avoided** | Not mentioned | $0.1618/VKT | Significantly lower than total car costs so as not to duplicate on-road costs |
| **'Shop local' economic multiplier** | Not mentioned | Not quantified | No suitable definition, data or value available |
| **Reduction in parking time** | 1 minute per day at $0.18 a minute | Not included to avoid double counting | PBA model includes a congestion reduction estimate |
| **Health benefits derived from increased physical activity** | $3.02 per additional minute walked | $0.126/minute walked<br>$0.1981/minute cycled | Accounts for the benefits that accrue from the physical activity |
| **Improved transport choice for low income households** | Not quantified | Not included | No suitable definition, data or value available |
| **Reduced congestion** (Reduced travel time on roads) | Not quantified | $0.2188/VKT | Accounts for the congestion impact of each additional VKT by car |
| **Reduced road trauma** | Not mentioned | $0.0472/VKT | Impact of change in VKT by car on road safety |
| **Reduced emissions impact on environment** (including carbon) | Carbon emissions at $1 a km x reduction in VKT | $$0.0064/VKT | Whole community economic impact |
| **Reduced emissions on public health** | Not mentioned | $0.0121/VKT | Whole community costs of health care (At the State & Commonwealth level) |
| **Reduced noise** | Not mentioned | $0.0029/VKT | Average of whole community impact |
| **Reduced impact on urban amenity** | Not mentioned | $0.0113/VKT | Accounts for nature, landscape and urban barriers |
| **Increase in land and structure value due to higher value use** | Not mentioned | Not quantified | No suitable definition, data or value available |
| **Avoided cost of construction of car parks** | Not mentioned | Not quantified | No suitable definition, data or value available |

*Source: SGS 2012 & PBA Analysis*

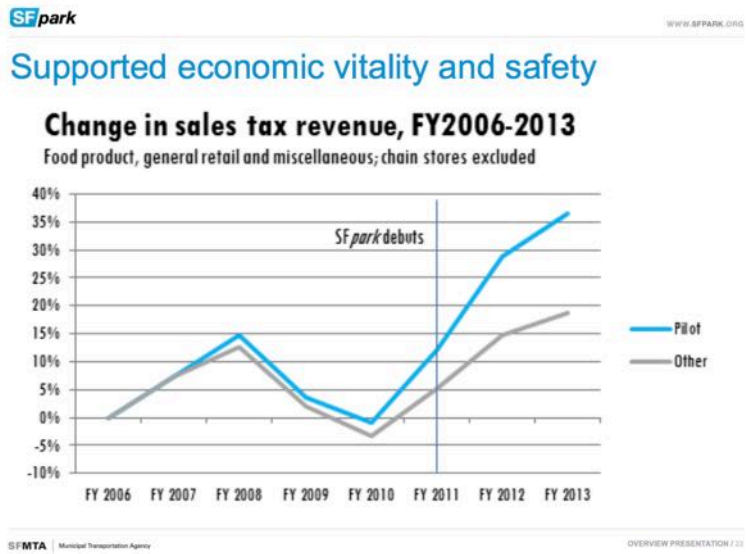
PHILLIP BOYLE & Associates

# Appendix D: Endnotes

*1 GoGet was launched as Newtown CarShare on 6 June 2003 with three vehicles and twelve founding members. The Sydney Morning Herald. 16 Nov 2004*
*2 Based on various Australian and international research and GoGet Carshare 2014 Member Survey (for the City of Port Phillip)*
*3 November 2012 http://www.cityofsydney.nsw.gov.au/council/news-and-updates/the-facts-of-the-matter/car-share-parking-spaces*
*4 http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0010/109099/CarSharingPolicy.pdf*
*5 Breathe Architects 'The Commons' 24 unit apartment block without underground car park which had been assessed to cost $750,000.*
*6 This element of the model is called Motorisation: Element DDD.*
*7 In 2011 29,539 households in the City of Sydney had no car (34.7% of all households) compared to 16.8% in Greater Sydney. The rate of cars per household is 0.64 or around 2 cars for every three households.*
*Comparing 2011 to 1991: Over the period there was an increase of 11,187 in the number of zero car households, up from 18,352 in 1991, and a decrease in the proportion, down from 44.2% in 1991.*
*http://profile.id.com.au/sydney/car-ownership?EndYear=1991*
*Analysis of car ownership in 2011, indicates 12% of households in the City of Sydney had access to two or more motor vehicles, compared to 44% in Greater Sydney. http://profile.id.com.au/sydney/car-ownership*
*8 The number of cars per household continues 'to fall in London, from 0.78 cars per household in 2008/09 to 0.76 in 2009/10. Meanwhile it's up very slightly in the rest of Britain, to 1.21 cars per household. So there are roughly three cars for every four households in London, compared to nearly five in the rest of Britain.'*
*https://londontransportdata.wordpress.com/category/subject/car-ownership/*
*9 In this report the word 'parking' is used for shorter time periods and 'storage' for longer periods. As a rule of thumb if the travel time for the return trip takes more than half the waiting time, then the dwell time is defined as 'parking'. If the dwell time is more than double the travel time such as at work or overnight, then the dwell time is 'storage'.*
*For example a lunch appointment may involve 'parking' – twenty minutes there and twenty back with an eighty-minute lunch in between. When a long distance commuter with a ninety-minute one-way trip (180 minutes travel) drives to work (480 minutes) they will under this definition be 'storing' their car. Storage at home for a car based commuter may be for 600 minutes or more. Irregular users will store their cars for days at a time.*
*10 http://www.rms.nsw.gov.au/about/corporate-publications/roads-report.html*
*11 The proportion of people using a motor vehicle to get to work was highest for those working in Outer South Western Sydney (89%) and lowest for those working in Inner Sydney (42%).*
*http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1338.1Main+Features10Dec+2010*
*12 Sometimes Councils issue more permits than spaces and residents use the kerb store more cars (and other things) than is permitted. Some householders maintain an off street parking option (which reduces the kerbside storage supply) and get a street storage permit.*
*13 http://profile.id.com.au/sydney/travel-to-work*
*14 In 2008, almost every household in Australia had a refrigerator (99.8%) and a washing machine (97%).*
*http://www.abs.gov.au/AUSSTATS/abs@.nsf/0/0E43C98B32A7FE85CA25750E00109A1D?opendocument*
*15 This element of the model is called Cost of Motoring:*
*16 According to IRS data, about 73% of the retail price of gas and 86% of the retail price of cars is the "cost of goods sold," which immediately leaves the local economy. The $1.1 billion Portlanders don't spend on car travel translates into $800 million that is not leaving the local region. - Portland's Green Dividend A White Paper from CEOs for Cities by Joe Cortright (jcortright@impresaconsulting.com) July, 2007*
*17 RACV's car owning and operating costs guide*
*18 http://www.roymorgan.com/findings/australian-moterists-drive-average-15530km-201305090702*
*19 Annual taxi travel of 120,000-150,000 kilometres http://www.esc.vic.gov.au/getattachment/f3f22493-62aa-4234-bb64-a95b79733669/Taxi-Fare-Review-2013-14-Final-Report.pdf*
*20 Bureau of Transport Statistics 2012/13 Household Travel Survey Summary Report*
*21 http://ec.europa.eu/environment/archives/cycling/cycling_en.pdf*
*22 http://www.thecitizen.org.au/analysis/more-cyclists-pedal-parkiteers-most-commuters-drive-train-stations#sthash.jfQ4GmmZ.dpuf*
*23 From various Australian and international research including Car Share Service Provider membership reports provided to the City of Port Phillip.*
*24 http://www.cityofsydney.nsw.gov.au/council/news-and-updates/sydney-city-news/sydney-city-news-june-2014/we-are-tackling-congestion-with-new-options*
*25 Two-thirds of weekday car trips did not have any passengers.*
*Nearly three quarters of vehicle kilometres travelled (73%) were in single-occupant vehicles.*
*Between 2001/02 and 2011/12, the average vehicle occupancy remained stable at 1.45. Trips to work (1.10) had a lower occupancy rate than non-work trips (1.66).*
*Bureau of Transport Statistics 2011/12 Household Travel Survey Summary Report, 2013 Release*
*26 Sydney Connecting our City: Transport Strategies and Actions 2012*
*27 http://www.cityofsydney.nsw.gov.au/vision/city-transformation/light-rail*
*28 http://www.sydneymedia.com.au/citys-1-94-billion-infrastructure-program/*
*29 Time of day tolling was introduced on the Sydney Harbour Bridge and Tunnel to help ease traffic congestion and to encourage motorists to travel outside peak hours where possible.*
*http://www.rms.nsw.gov.au/roads/using-roads/motorways-tolling/paying-tolls/sydney-harbour-bridge-tunnel.html*

*30 http://ptv.vic.gov.au/tickets/myki/myki-money/*
*31 http://www.legislation.nsw.gov.au/viewtop/inforce/act+5+2009+cd+0+N/*
*32 World Cities Summit 2014 Mayors Forum Report*
*33 https://envirojustice.org.au/sites/default/files/files/Submissions%20and%20reports/Envirojustice_air_pollution_report_final.pdf*
*34 http://clovermoore.com.au/working-for-sydney/issues/transport/*
*35 http://www.dailytelegraph.com.au/news/nsw/car-spaces-derailed-in-light-rail-chaos/story-fni0cx12-1227364584695*
*36 At least 660 car parking spaces have been lost to Lord Mayor Clover Moore's bike paths*
*http://www.dailytelegraph.com.au/news/nsw/m-bike-path-on-college-st-sydney-dismantled-as-research-shows-cycling-rates-drop/story-fni0cx12-1227457780947*
*37 We say that on-street parking is a pretty inefficient use of valuable street space, in particular where there are competing demands for traffic lanes and bicycle facilities," the motoring group manager said. "These spaces could be better used for car lanes, bicycle lanes, and bus lanes. "If there is a demonstrated cycle route in a particular corridor and there is on-street parking, then perhaps that parking should go so that a cycling lane can be provided and the traffic lanes can remain as they are."*
*http://www.heraldsun.com.au/news/victoria/racv-proposal-to-cut-city-parking-spaces-for-bike-vehicle-lanes/story-fnpp4dl6-1227459189102*
*38 Portland's Green Dividend A White Paper from CEOs for Cities Cortright 2007*
*All told, the out-of-pocket savings work out to $1.1 billion dollars per year. This works out to about 1.5 per cent of all personal income earned in the region in 2005.*
*This is a good minimum estimate of the aggregate economic benefits—the green dividend—that Portland area residents enjoy as a result of land use planning and related environmental policies. But the benefits don't stop there. Since Portlanders don't spend that money on transportation, they have more money to spend on other things. Because so much of what is spent on transportation immediately leaves the state—Oregon makes neither cars nor gasoline—money not spent on transportation gets spent on sectors of the economy that have a much larger local multiplier effect. (Think locally-brewed beer.) According to IRS data, about 73 per cent of the retail price of gas (back when it was under $2 a gallon, by the way) and 86 per cent of the retail price of cars is the "cost of goods sold," which immediately leaves the local economy.*
*The $1.1 billion Portlanders don't spend on car travel translates into $800 million that is not leaving the local region. Because this money gets re-spent in other sectors of the economy, it stimulates local businesses rather than rewarding Exxon or Toyota. So where does the money saved on traveling fewer miles get spent? We don't know exactly, but we have some clues. National data show that there is an inverse relationship between household spending on transportation and housing: households that spend more on transportation spend less on housing, and vice versa. Shorter distances travelled means Portland residents have more money to spend on their homes. We also know that Portlanders spend more on some things — outdoor recreation and alcoholic beverages, for example. And, not incidentally, Portland has more restaurants per capita than any other large metropolitan area, save Seattle and San Francisco.*
*39 Hassell architects principal Matthew Pullinger, who represented the Australian Institute of Architects in government consultations about the changes, said that building an underground car park was often the most expensive part of a development — costing between $50,000 to $70,000 per underground car spot.*
*http://www.dailytelegraph.com.au/news/nsw/flat-out-savings-on-parking-in-sydney-apartments/story-fni0cx12-1227067124940*
*A car park in the city can cost between $120,000 and $140,000," he said.*
*"If you are in south Sydney, Crows Nest, St Leonards or Chatswood your car park is worth $70,000 to $80,000. Parramatta might be $50,000.*
*http://www.smh.com.au/nsw/parking-requirements-to-be-cut-back-under-new-design-standards-proposed-for-apartments-20140923-10kw9f.html*
*40 'consider a person contemplating purchase of a one bedroom unit with a car park for $350,000. That purchase would require mortgage payments of approximately $1,090 per fortnight (at 6.5 % interest over 25 years). By comparison, if that person was to buy the same one bedroom unit without the car park for $300,000, whilst directing the previously budgeted payments as well as their transport savings to their mortgage payments, they would save approximately $155,000 interest and 11 years and 5 months off their loan, in addition to the $50,000 capital savings.'*
*Conics position Paper 2009*
*41 RACV's car owning and operating costs guide*
*42 An occupancy rate of 80% is generally viewed as supporting optimum turnover. When occupancy is below 80%, the visitation is too low. When the occupancy is above 80% then people are unable to reach the destination.*
*43 The 'minimalist' peer-to-peer services act as a broker and marketplace; enabling a vehicle owner to recoup some of the costs they have incurred owning a vehicle they do not use very much. This system has two winners and one loser. The broker can make money when the low-use vehicle is hired and the 'renter' can get 'immediate and convenient access to a vehicle' for an hourly fee, but the owner has to bear all the remaining ownership and running costs of the vehicle. The 'third party' car share services own and rent out the vehicles in their fleet. In this system – when usage is high enough – everyone is a winner.*
*44 http://www.vtpi.org/tca/tca0504.pdf*
*45 The evolution of car parking – technology creating risk and opportunity Colliers 2015*
*46 https://urban.melbourne/planning/2014/03/10/planning-application-12-queens-road-melbourne*
*This marketing copy from the developer is interesting as it indicates that this developer considers that in this location fewer car parks will be a feature that will attract purchasers.*
*47 The City of Melbourne's current parking policy is to limit provision of parking in residential buildings.*
*In March 2010, the City of Melbourne adopted planning scheme amendment C133, which applies to Carlton, Southbank and parts of North Melbourne, West Melbourne and East Melbourne. It allows the provision of zero on-site car parking spaces in residential developments over four storeys, and places a discretionary limit of one car parking space per dwelling. This amendment was based on demographic and*

*accessibility analysis, which determined that the areas affected by the amendment have excellent accessibility to public transport and other facilities.*
*Following the success of this amendment, the City of Melbourne will pursue another amendment to the planning scheme to set maximum car parking rates for other land uses (for example, offices) throughout the municipality, and review the area to which amendment C133 applies.*
*The Transport Strategy Planning for Future Growth 2012*
*48 Dustin Wu director of W Property Group Cirque apartments Bridge Road Richmond*
*49 Of those respondents who indicated dissatisfaction with the performance of the council in the past 12 months the most common reasons for doing so were: local roads and footpaths (17%), the cycle-ways \ anti-car stance (17%), and traffic management and parking facilities (16%). 2011 Community Satisfaction Survey City of Sydney*
*50 Some of the estimates rely on self-reported data form car share users. For example, the shift in mode that is brought about by car share use is self-reported. Even though the data is self-reported a number of similar surveys in Europe and North America have shown similar results. In Australia, the various service providers collect this data using their own survey questions. These questions are similar but do vary between service providers. It will be important in the future to establish consistent and robust methods for these measures.*
*51 Occupancy rates and retail turnover*




*https://www.sfmta.com/sites/default/files/pressreleases/SFpark%20Evaluation%20Presentation%206.19.14.pdf*
*52 Zero Carbon Evolution Getting on track to a carbon neutral Moreland community 2014*
*53 The City of Sydney Sustainable Sydney 2030 Community Strategic Plan 2014*
*54 Zero Carbon Evolution Getting on track to a carbon neutral Moreland community 2014*
*55 An estimate could be gained from the vehicle registration system. However people do not reliably update their vehicle registration to align it with their place of residence.*
*56*

### A3.2.1 Comparison of availability of car parking facilities across airports

**Table A3.2.1: Availability of car parking facilities at the monitored airports in 2012–13**

| Airport | Number of short-term car parking spaces | Number of long-term car parking spaces | Number of staff car parking spaces |
|---|---|---|---|
| Brisbane* | 1 119 | 9 818 | 3 038 |
| Melbourne | 7 441 | 14 650 | 2 627 |
| Perth | 2 675 | 13 396 | 972 |
| Sydney | 6 856 | 5 817 | 4 349 |

Note: *Brisbane Airport's international terminal has a single car park which caters for long and short term. Spaces are included in the long-term car parking.

*https://www.accc.gov.au/system/files/Airport%20Monitoring%20Report%202012-13_2.pdf*
*57 Sydney Connecting our City: Transport Strategies and Actions 2012*
*58*
*Motorisation is a term used by the EU to refer to the number of private vehicles per head of population.(Motorization is used in the USA to refer to a number of comparisons with the number of registered motor vehicles including licenced drivers, households and population.)*

*The EU definition:*
*This indicator is defined as the number of passenger cars per 1 000 inhabitants. A passenger car is a road motor vehicle, other than a motorcycle, intended for the carriage of passengers and designed to seat no more than nine persons (including the driver). The term "passenger car" therefore covers micro-cars (need no permit to be driven), taxis and hired passenger cars, provided that they have fewer than 10 seats; this category may also include pick-ups. Follow the Glossary for transport statistics. The number of passenger cars is taken from the national vehicle registers. The population figures are obtained from the current estimates of population counts. The indicator is calculated as follows: Passenger car stock at end of year n has been divided by the population on 1 January of year n+1.*
*http://ec.europa.eu/eurostat/cache/metadata/en/tsdpc340_esmsip.htm*
*The indicator is a Sustainable Development Indicators (SDI). It has been chosen for the assessment of the EU progress towards the targets of the Sustainable Development Strategy.*
*59 Australia, EU: Worldwide Passenger Cars (per 1,000 people), The World Bank Group viewed 2013 no longer available. Paris, Amsterdam: Eurostat, Urban Audit 2012*
*60 Exceptions include the Brisbane City Council, which runs the buses in Brisbane and the community bus services run by some Councils.*
*61 Connecting our City: Transport Strategies and Actions 2012*
*62 City of Melbourne: The Transport Strategy Planning for Future Growth 2012*
*63 City of Melbourne: The Transport Strategy Planning for Future Growth 2012*
*64 Connecting our City: Transport Strategies and Actions 2012*
*65 http://www.rms.nsw.gov.au/trafficinformation/downloads/td07_04i.pdf*
*66 The City of Sydney Cycle Strategy and Action Plan 2007-2017 identifies these goals*

- *reduced road costs;*
- *reduced overcrowding on public transport;*
- *lower greenhouse gas emissions;*
- *lower air pollution;*
- *reduced accidents; and,*
- *Reduced health costs from increasing physical activity.*

*67 Goal*
*Public transport will be the most attractive way to travel around the municipality and the inner metropolitan Melbourne region. An integrated system of rail, tram, bus, taxi, car and bike share will meet customer's needs and be fully coordinated with the municipality's pedestrian network. It will be possible to live and do business in inner Melbourne without needing a car.*
*Overview*
*Public transport includes rail, tram, bus, taxi, car share and bike share and, for regional trips, air travel – all cases of the use of a shared vehicle. Government plays a major role through ownership, operation, regulation and coordination of these services.*
*State Government is largely responsible for running much of the public transport system, but local government, as the land use regulator, and the manager of the pedestrian network, has a key role integrating the system with land use and the walking component of each public transport trip.*
*The City of Melbourne has an additional role, as it is at the hub of the public transport system.*
*68 The Queensland government took over the private tram operations in Brisbane in 1923 and transferred them two years later to the new Brisbane City Council. In 1948 the Council took over the private bus operators to establish today's Brisbane Transport, which operates alongside State Government bus and train lines as well as private bus lines.*
*69 Car share best practice can be derived from the provision of other services including:*

- *Transport of garbage from residents homes - garbage collection contracts provide equity of access to all residents, and best practice selects service providers based on a range of factors including price and appropriate disposal standards*
- *Library services - provided in-house or through a contract tend to focus on equity of access and reducing the cost to access information*
- *Leisure services - tend to be provided on the basis of a specific catchment area, with best practice filling market gaps, not competing with the private sector*
- *Community based health and welfare services – can be provided in-house or by third parties partly funded by Council through grants programs to ensure equity of access and high service standards*

*From these locally provided services we see the following best practice outcomes:*

- *Equity of access to the service (for all residents/ratepayers) is an important outcome*
- *Future community needs are planned for and services are expanded to meet those needs*
- *Service standards and community expectations are defined clearly*
- *Services are provided (in-house or in partnership with third parties) in an efficient manner*
- *Service provision is monitored to confirm appropriate delivery and monitor community satisfaction*

*These are typically achieved with the following best practice approaches*

- *The community's needs with respect to the service are investigated and understood*
- *Clear strategy that guides growth of services to meet future community needs is defined*
- *There is political involvement and consultation in forming strategy and policy but not in day to day decisions (such as which books to purchase for the library or which route the garbage trucks should use).*
- *Tendering is often used to select the service provider that can best meet service standards (and provides open competition between in-house and private sector providers).*
- *Monitoring processes ensure compliance with service specification and confirm that community expectations are being met.*

*70 The Remote Air Services Subsidy (RASS) Scheme is part of the Australian Government's Regional Aviation Access Programme (RAAP). RASS subsidises a regular weekly air transport service for the carriage of passengers and goods such as, educational materials, medicines, fresh foods and other urgent supplies to communities in remote and isolated areas of Australia. Due to the distances involved and with road access to*

*many communities often cut for several months during the wet season, a regular air service offers the only reliable means of transport. Mail is carried on these flights under a separate contract with Australia Post.*
*71 http://www.cityofsydney.nsw.gov.au/vision/major-developments/green-square/green-square-projects*
*72 Rawnsley and Szafraniecz (2010) 'Agglomeration and Labour Productivity in Australian Cities', available at http://www.sgsep.com.au/ agglomeration-and-labour-productivity Australian-cities*
*73 Connecting our City: Transport Strategies and Actions 2012*
*74 Public transport services including:*

- *Bus stops and bus layover bays*
- *Taxi ranks, feeder ranks and holding bays*
- *Loading and Truck Zones*
- *Disability parking*
- *Diplomatic, Commonwealth and State vehicles*
- *Hospital parking*
- *Postal services*
- *Tourist coaches*

*75 When spaces are promised then postponed this triggers costs for the service providers and compromises growth. When a new bay is anticipated the service provider purchases and prepares a vehicle. If the delivery of the bay is delayed or withdrawn the service provider is unable to earn revenue from the vehicle and has additional storage costs until it can be deployed.*
*76 City of Sydney $597,481,000 income (2014) of which $45million is meter and parking station revenue http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0009/219969/Financial-Statements-2013-14.pdf http://www.carsguide.com.au/car-news/sydney-parking-meters-raking-in-123000-every-day-33004#.VcwoYJOqpBc*
*77 South Sydney Development Control Plan 1997: Urban Design - Part G: Special Precinct No.9 Green Square December 2006*
*78 3.11.2 Car share scheme parking spaces These provisions apply to development that provides a car share scheme for the buildings occupants. Land Use and Transport Integration (LUTI) Map means the Sydney LEP 2012 Land Use and Transport Integration Map. Public Transport Accessibility Level (PTAL) Map means the Sydney LEP 2012 Public Accessibility Level Map. Land in accessibility category A, B or C is shown on the LUTI Map and land in accessibility category D, E or F is shown on the PTAL Map. (1) Car share parking spaces may be provided in addition to the maximum number of car parking spaces permitted in the development. (2) The minimum number of on-site parking spaces to be made available for car share scheme vehicles is to be provided according to the following rates: (a) residential development, other than dwelling houses and dual occupancies, on land shown on the Land Use and Transport Integration (LUTI) Map in the Sydney LEP 2012 as: (i) Category A - 1 per 50 car spaces provided; (ii) Category B - 1 per 60 car spaces provided; or (iii) Category C - 1 per 90 car spaces provided. (b) office premises, business premises or retail premises on land shown on the PTAL Map in the Sydney LEP 2012 as: (i) Category D - 1 per 30 car spaces provided; (ii) Category E - 1 per 40 car spaces provided; or (iii) Category F - 1 per 50 car spaces provided. Sydney DCP 2012 - December 2012 3.11-3 Section 3 GENERAL PROVISIONS ENERAL PROVISIONS (3) All parking spaces for car share schemes are to be: (a) publicly accessible 24 hours a day seven days a week; (b) located together in the most convenient locations; (c) located near and with access from a public road and integrated with the streetscape through appropriate landscaping where the space is external; and (d) designated for use only by car share vehicles by signs. (4) Parking spaces for car share schemes located on private land are to be retained as common property by the Owners Corporation of the site.*
*79 Business members use the share cars based in the City of Sydney during work hours. This enables the company to reduce car pool costs.*
*80 Prochaska and DiClemente The Transtheoretical Model various*
*81 Fleet deployment (mode management) fees in City of Melbourne*

| | *Hoddle Grid* | *CBD* | *Outside CBD* |
|---|---|---|---|
| *First year of deployment* | *$1,500* | *$1,000* | *$100* |
| *Second year of deployment* | *$3,000* | *$2,000* | *$200* |
| *Third year of deployment* | *$3,000* | *$3,000* | *$300* |
| *Previously deployed cars* | *$3,000* | *N/A* | *N/A* |

*82 The number of parking meters in the City of Sydney. http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0019/120376/OnstreetParkingPolicy.pdf*