Report to the Future Melbourne (Transport) Committee

Agenda item 6.7

Car Share Services Review

14 July 2015

Presenter: Geoff Robinson, Manager Engineering Services

Purpose and background

1. The purpose of this report is to present the findings of a review into car share operations in the City of Melbourne and to recommend a new operating model.

2. In 2010, the Future Melbourne Committee resolved to undertake a three year trial of car share in the Hoddle Grid and noted it was already well established outside the Grid. The trial commenced in 2011. Council required the review as part of its Annual Plan for 2014–15.

Key issues

3. At Attachment 3 is a consultant report that recommends that Council facilitate growth in the car share fleet operating in the city from 245 to approximately 2000 vehicles by 2021. Given that these services are offered by the private sector, the key policy mechanism for Council is the extent to which it will allow access to dedicated parking spaces under its control. Management recommends that, because of other community demands for on-street parking, Council accommodate one third of the target and require private operators to source the other two-thirds from off-street parking. The report also makes many administrative recommendations but management recommends a simpler approach that takes into account the need for flexibility in the deployment of on-street parking, recognition of the impact on existing Council revenue, the likelihood that car share demand will grow progressively and that new companies may enter the market.

4. Management recommends that Council grows the number of available on-street car share spaces consistent with demand (estimated to be 60 spaces per annum) so that by 2021, there will be 30 on-street spaces inside the Hoddle Grid, 70 spaces in the wider CBD, 160 in currently metered non-CBD spaces and 340 in currently free spaces elsewhere.

5. Management recommends that Council determines to share the spaces available on an annual basis among those companies that meet specified criteria, are willing to pay set fees and have secured independently two off-street spaces for every on-street space requested. A proposed set of criteria is in Attachment 2.

6. Management recommends that Council sets an annual fee for on-street spaces for the next three years based on partial cost recovery of current meter revenue and including transitional arrangements that preserve the fee for current spaces and escalate the fee for new spaces over the period. The impact of this fee structure is described in Attachment 1.

7. Subject to approval, the new operating model can commence in September 2015.

Recommendation from management

8. That the Future Melbourne Committee recommends that Council:

   8.1. Approves the model for future expansion of car share services in the City of Melbourne at Attachment 2 to this report.

   8.2. Approves the annual fee structure for occupation of on street spaces by car share vehicles described as Option 3 (Partial Cost Recovery) in Attachment 1 for the next three financial years.

   8.3. Authorises the Chief Executive Officer to implement the car share expansion and cost recovery models commencing in September 2015.

   8.4. Notes that a status report will be provided annually to Councillors.

Attachments

1 Supporting attachment
2 Proposed model for future expansion of car share services in the City of Melbourne
3 Car share services review, Phillip Boyle & Associates

Supporting Attachment

Legal

1. Legal advice will be provided as required in respect to the Car Share Scheme.

Background Issues

2. The aim of a car share scheme is to reduce on-street and off-street parking demands and traffic congestion by reducing car ownership rates and vehicle kilometres travelled. The consultant's review estimated that each new car share vehicle results in residents/workers disposing of ten privately owned vehicles (a net reduction of nine vehicles). The review also suggests that car share members in the City of Melbourne drive approximately 2000 kilometres per year, while non-members drive 4000 kilometres per year. Assuming that one car share vehicle can support approximately 20 members, it is estimated that each car share vehicle reduces vehicle kilometres travelled by 40,000 kilometres per year.

3. The installation of an additional 390 on-street car share spaces is anticipated to include the removal of approximately 130 fee paying car spaces.

4. Generally, management is supportive of the Consultant's report and recommendations in this regard.

Finance

5. Car share service providers are currently charged a fee only for the use of the 21 spaces located in the Hoddle Grid as part of the 3 year trial (currently $3000 per space per annum). All other on-street spaces in the municipality have been provided free of charge. Given the significant increase of on-street car share spaces proposed as part of this review, the introduction of a modified cost recovery model to mitigate the significant loss in revenue is proposed. It is estimated that the current total net revenue loss associated with the provision of the 210 car share spaces on-street is approximately $230,000 per annum.

6. The parking meter revenue per year generated by an average fee parking space in the City of Melbourne is estimated below. This estimation accounts for the fact that fee parking spaces outside the CBD are subject to a range of fees per hour, depending on the time limit, varying from 80 cents per hour to $3.20 per hour:

    6.1. Inside the CBD: $7000 per annum

    6.2. Outside the CBD: $2400 per annum

7. The parking meter revenue forgone as the result of the removal of an existing fee parking space is significantly less than the average parking meter revenue collected from a parking space. This is due to the fact that unless parking occupancies in a specific area are close to 100 percent, motorists will simply obtain an alternative nearby available parking space. Subsequently, the estimate of the parking meter revenue forgone per fee parking space removed is summarised below:

    7.1. Inside the Hoddle Grid: $5400 per annum

    7.2. Inside the CBD (but outside Hoddle Grid): $3800 per annum

    7.3. Outside the CBD: $900 per annum

8. The expansion model (refer Attachment 2) outlines that two-thirds of all car share spaces outside the CBD will be provided in free parking areas by 2021. Therefore, the average parking meter revenue forgone by Council will be $300 for every car share space provided outside the CBD. A full cost recovery model would impose the following fees on car share providers.

    8.1. Inside the Hoddle Grid: $5400 per annum

8.2. Inside the CBD (but outside Hoddle Grid): $3800 per annum

8.3. Outside the CBD: $300 per annum

9. Three options for a cost recovery model (of lost parking meter revenue) are summarised below. Strict guidelines for when new spaces are installed and when the fees become operative will need to be implemented and monitored. In summary, the options are as follows:

9.1. Option 1 represents a free car share provision model. Net parking meter revenue losses would increase from $230,000 to $580,000 per annum by 2021.

9.2. Option 2 represents a full cost recovery model. There will be no net parking meter revenue loss by 2021.

9.3. Option 3 represents a partial cost recovery model. Net parking meter revenue losses gradually decrease from $230,000 to $110,000 per annum by 2021.

10. **Option 1: Free car share provision model (applies to existing and new spaces)**

10.1. Inside the Hoddle Grid: No fee for car share spaces (therefore, the 21 spaces inside the Hoddle Grid which currently impose a fee of $3000 per annum on car share providers would also be provided free of charge).

10.2. Inside the CBD (outside Hoddle Grid): No fee for car share spaces.

10.3. Outside the CBD**:** No fee for car share spaces.

11. **Option 2: Full Cost Recovery Model (applies to existing and new spaces)**

11.1. Inside the Hoddle Grid: $5400 per space per annum.

11.2. Inside CBD (outside Hoddle Grid): $3800 per space per annum.

11.3. Outside the CBD: $300 per space per annum (regardless of whether the car share space is provided in a free parking area or a metered parking area).

12. **Option 3: Partial Cost Recovery Model**

12.1. The costs provided below relate to the "year which the proposed fees on the space begin". The 21 existing spaces inside the Hoddle Grid will initially be charged a fee of $3000 per space per annum to ensure that the existing fee imposed is not reduced. All other existing car share spaces (which are currently provided free of charge) will be subject to an initial fee and two annual increments as detailed below.

12.1.1. **Inside the CBD:**

12.1.1.1. Year 1: $1500 per space per annum

12.1.1.2. Year 2: $3000 per space per annum

12.1.1.3. Year 3: $4500 per space per annum.

12.1.2. **Inside CBD (Outside Hoddle Grid)**

12.1.2.1. Year 1: $1000 per space per annum

12.1.2.2. Year 2: $2000 per space per annum

12.1.2.3. Year 3: $3000 per space per annum.

12.1.3. **Outside CBD**

12.1.3.1. Year 1: $100 per space per annum

12.1.3.2. Year 2: $200 per space per annum

12.1.3.3. Year 3: $300 per space per annum.

12.2. The proposed fees for spaces outside the CBD will be imposed regardless of whether the car share space is provided in a free parking area or a metered parking area to ensure car share operators do not target only free parking spaces to the detriment of residents.

13. It is estimated that the 210 existing on-street car share spaces currently results in an annual loss of parking meter revenue of approximately $300,000 per year.

14. The table below summarises the estimated changes in revenue collected by Council from car share providers with each of the potential cost recovery models. This assumes the implementation of the proposed expansion model (see Attachment 2).

Estimated Annual Revenue Collected from Car Share Providers

	2015 (existing)	End of 2015/16	End of 2016/17	End of 2017/18	End of 2018/19	End of 2019/20	End of 2020/21	End of 2021
Option 1 Free Provision of Spaces	63000	0	0	0	0	0	0	0
Option 2 Full Cost Recovery Model	63000	358600	397000	435400	473800	512200	550600	578000
Option 3 Partial Cost Recovery Model	63000	132700	245100	337200	370800	404400	438000	468200

15. The net parking meter revenue forgone is based on the difference between the revenues collected from car share providers (see table above) and the parking meter revenue lost as a result of removing metered parking spaces. The table below summarises the estimated annual net parking meter revenue forgone. Similar to above, this table assumes the implementation of the proposed expansion model (see Attachment 2).

Estimated Net Parking Meter Revenue Forgone

	2015 (existing)	End of 2015/16	End of 2016/17	End of 2017/18	End of 2018/19	End of 2019/20	End of 2020/21	End of 2021
Option 1 Free Provision of Spaces	232600	385857	425286	462486	497457	530200	560714	578000
Option 2 Full Cost Recovery Model	232600	27257	28286	27086	23657	18000	10114	0
Option 3 Partial Cost Recovery Model	232600	253157	180186	125286	126657	125800	122714	109800

16. The table above indicates that under the full cost recovery model (Option 2), by the end of 2021, there will be no loss in annual fee parking revenue. Option 3 effectively stabilises the loss of annual fee parking

revenue at rates similar to existing conditions and would therefore result in no significant change to annual Council revenue.

17. The recommended fees imposed on car share service providers under each potential cost recovery model will increase proportionally in line with any future on-street fee parking increases.

Conflict of interest

18. No member of Council staff, or other person engaged under a contract, involved in advising on or preparing this report has declared a direct or indirect interest in relation to the matter of the report.

Stakeholder Consultation and Engagement

19. A stakeholder engagement workshop was held with 38 community representatives invited. 10 public stakeholders attended the workshop including representatives of local resident groups, retail trader associations, developers and car share service users.

20. A workshop was also held for local government staff from the City of Melbourne and all adjoining municipalities. Telephone interviews were also conducted with car share operators (including some yet to commence operations in Australia) and representatives of the Cities of Darebin and Moonee Valley.

21. Reactions to car share were quite positive, particularly regarding the potential for car share to reduce private car use and complement the continued growth of the City's population. Car share was seen as a public good that was deserving of the City's support; provided that adequate performance monitoring was in place and local impacts were monitored. Some concerns were expressed regarding existing spaces operating outside retail premises. Stakeholders flagged a preference for locating car share spaces in residential areas, both on-street and in developments.

22. Fee recovery models have been discussed with the current car share service providers. The car share service providers appreciated the substantial loss in revenue to the City of Melbourne and also appreciated the consideration of varying cost recovery models. Nevertheless, they indicated concern about penalising existing customers through increased costs. In addition, they were also concerned about the viability of low performing spaces through cost recovery models. Overall, car share operators do not support any increase in fees or extension of the current cost/payment structure.

Sensitivity Analysis

23. The consultant estimated the impact of several cost recovery scenarios based on modelled assumptions as the car share operators only provided information to the consultant in confidence. The estimates are as follows:

    23.1. A fee of $6000 per annum per space in the CBD would result in:

        23.1.1. An eight percent reduction in car share membership;

        23.1.2. Approximately 40 percent of the existing on-street spaces (20 spaces) inside the CBD being relocated to an off-street location in order to reduce operating costs by approximately $1500 (fee for off-street space in CBD estimated at $4500 per annum); and

        23.1.3. The total overall number of car share vehicles across the network (on-street and off-street) reducing by approximately 20 vehicles in line with the predicted reduction in membership.

23.2. A fee of $3000 per annum per space throughout the CBD (ie: introducing this fee to spaces outside the Hoddle Grid but within the CBD) would result in:

23.2.1. A four percent reduction in car share membership;

23.2.2. All companies maintaining their existing on-street spaces inside the CBD; and

23.2.3. The total overall number of car share vehicles across the network (on-street and off-street) reducing by approximately ten vehicles in line with the predicted reduction in membership.

23.3. A fee of $1000 per annum per space outside the CBD (ie: introducing this fee to spaces outside the Hoddle Grid but within the CBD) would result in:

23.3.1. A two to three percent reduction in car share membership;

23.3.2. The total overall number of car share vehicles across the network (on-street and off-street) reducing by approximately seven vehicles in line with the predicted reduction in membership.

Relation to Council policy

24. The car share Services Policy is consistent with, and supported by the Transport Strategy 2012 that sets mode share targets that equate to an 18 percent reduction in motor vehicle trips to the City by 2020 and a further 11 percent reduction in motor vehicle trips within the City by 2030. The car share services policy as drafted would result in no net increase in motor vehicle trips within the City. Other additional policies will be required to achieve the target of a reduction in vehicle trips.

25. The City of Melbourne Transport Strategy 2012 committed the City to 'review the car sharing policy to ensure it meets the objectives of the Transport Strategy' (Priority Action 95). The Strategy also set an operational target of 'a minimum of 300 on-street car share spaces are installed in the City of Melbourne by October 2016.

26. The City of Melbourne Planning Scheme and the Zero Net Emissions Strategy specifically refers to car share services as a significant opportunity to improve the City that should be supported. The Road Safety Plan refers to installation of the car sharing network as a key success of the previous safety plan and local level implementation documents such as the Southbank Structure Plan state that car sharing should be expanded to better meet community needs.

27. There are no Council policies or Victorian Government policies that seek to reduce or restrict car share services.

Environmental sustainability

28. The modelling undertaken for this policy shows that car share reduces car ownership and use, and thereby significantly reduces negative environmental impacts from transport (such as noise, emissions and urban amenity).

Proposed Model for Future Expansion of Car Share Services in the City of Melbourne

The following paragraphs detail a model proposed for expansion of car share services. The model addresses issues of location and number of spaces as well as performance measurement.

Location Criteria

1. Location decisions to be reviewed and determined every six months. To achieve the target of 600 on-street car share spaces by the end of 2021 will require the installation of approximately 60 on-street spaces per annum.

2. The future supply of 2000 car share spaces comprises 600 on-street spaces and 1400 off-street spaces. Consequently, car share providers will be required to install a minimum two new off-street spaces for every new on-street space approved by Council. Car share providers will be permitted to provide these off-street spaces in any precinct they decide and will be required to enter into agreements with private car parking operators or building managers.

CENTRAL BUSINESS DISTRICT

3. The number of on-street spaces inside the Hoddle Grid to be increased from 21 to 30 spaces.

4. The number of on-street spaces inside the CBD (but outside the Hoddle Grid) to be increased from 29 to 70 spaces.

5. This will result in a total of 100 on-street spaces inside the CBD.

6. It is estimated that the majority of the off-street spaces which are required to be provided by car share providers will be inside the CBD. It is estimated that 1130 of the 1400 proposed off-street spaces will be provided inside the CBD. Nevertheless, car share providers will be free to establish off-street spaces wherever they determine most appropriate.

OUTSIDE THE CBD

7. The number of on-street car share spaces outside the CBD to be increased from 160 spaces to 500 spaces by 2021.

8. New spaces outside the CBD should primarily be provided in residential streets, most likely at the expense of resident priority parking.

9. 260 of the 340 new spaces outside the CBD (76%) will be provided in free on-street spaces (primarily in residential areas).

10. The remaining 80 new spaces outside the CBD (24%) are proposed to be provided in existing fee parking spaces. This should primarily include locations which are not adjacent to business operators, and should therefore include centre of road spaces in residential streets and spaces adjacent to park lands.

11. It is estimated that 270 off-street spaces will be provided outside the CBD (but will be dictated by the car share providers).

12. New on-street car share spaces may only be installed adjacent to businesses in circumstances where a business owner/operator requests the installation of a car share space and this is supported by surrounding businesses.

13. Car share spaces to be located where people live (expanding service coverage) and in proportion to the size of the population (maintaining appropriate service capacity). The use of the service will be maximised by co-locating vehicles where demand is high.

14. Vehicles will be located in consistent locations and in a way that minimises the impact on other road users, maximises access for residential users and maintains transport system safety. Generally, coverage will be maximised by locating vehicles in abutting 200m catchments. The walking catchment area will be maximised by locating vehicles near intersections where possible. To also reduce travel delays, spaces will be positioned near arterial roads where feasible.

SUMMARY OF PROPOSED EXPANSION MODEL

15. The table below summaries the approximate proposed increase in car share spaces inside and outside the CBD.

	Existing	**Future (2021)**	**Increase**
Inside the CBD			
On-Street	50 (21 inside Hoddle Grid)	100 (30 inside Hoddle Grid)	+50
Off-Street *(approximate – up to car share providers discretion)*	40	1130	+1090
TOTAL INSIDE CBD	**90**	**1230**	**+1140**
Outside the CBD			
On-street (free spaces)	80	340	+260
On-street (metered spaces)	80	160	+80
Off-Street *(approximate – up to car share providers discretion)*	0	270	+270
TOTAL OUTSIDE CBD	**160**	**770**	**+610**
Total Spaces			
On-Street	210	600	+390
Off-Street *(approximate – up to car share providers discretion)*	40	1400	+1360
TOTAL	**250**	**2000**	**1750**

Performance Review

16. The performance of all car share spaces will be monitored regularly according to the criteria noted below. Poorly performing spaces will be relocated or removed.

17. The following conditions will apply to all existing car share service providers and any new providers. All car share service providers will be required to enter into a contract agreement with the City of Melbourne governing the terms of use of on-street spaces:

    17.1. Car share service providers will provide a half yearly review to identify and report on .

        17.1.1. Locations that are underserved, over used or under performing
        17.1.2. Performance of the service
        17.1.3. Public comments, complaints and grievances

    17.2. Performance details requested of the car share service providers include:

        17.2.1. The scale and growth of vehicles and members
        17.2.2. The member to vehicle ratio
        17.2.3. Areas where members do not have convenient access
        17.2.4. Locations where cars have insufficient members or too many members.
        17.2.5. Locations where vehicles have failed to be provided
        17.2.6. Locations where the vehicles are not active enough or are too busy.

    17.3. New car share providers seeking entry to the municipality will be evaluated on their ability to meet the following two main objectives of the car share policy. This could potentially include alternative car share models to the current fixed base model. :

        17.3.1. Reduce car ownership
        17.3.2. Reduce car usage

    17.4. New car share operators will be required to enter into legal agreements with the City of Melbourne governing the terms of their use of on-street spaces. To qualify, the provider must:

        17.4.1. Be proposing to develop a network of cars in locations that are accessible to all members.
        17.4.2. Allow any licensed driver to join, subject to reasonable creditworthiness and driving history checks.
        17.4.3. Provide an internet and phone-based booking system. This should allow all members to make immediate bookings 24 hours per day.
        17.4.4. Provide members with keys / access cards which enable them to access booked vehicles.
        17.4.5. Offer minimum booking durations of one hour or less at a reasonable fee in line with other car share companies.
        17.4.6. Notify and consult with nearby property occupiers and building managers of the intention to apply for the installation of a car share space. The notification letter should include a map or photo plan which clearly illustrates the proposed location of the new car share space and a contact phone number for the community to contact if they have any concerns. The City of Melbourne must be advised of any objections received.
        17.4.7. Install a vehicle within an approved on-street car share space within two weeks of the signage and line marking being installed. It is noted that the City

of Melbourne will provide approximate dates for the installation of signage and line marking when the car share spaces are approved.

17.4.8. Ensure that no on-street space is booked or removed for maintenance for longer than four days unless a replacement vehicle is provided.

17.4.9. Prohibit a particular member or business regularly booking the same on-street vehicle for long durations and subsequently restricting access of this vehicle to other members.

17.4.10 Use passenger vehicles with at least a 4-star rating in the Australian Green Vehicle Guide

17.4.11 Inform the City of Melbourne during the application process if intending to install a van or utility vehicle prior to approval for the space and vehicle being provided. The operator must also notify and receive written approval from surrounding property occupiers and building managers of the proposed vehicle type. The operator must also demonstrate that the vehicle is a high environmental performer for its class.

17.4.12 Accept that the City of Melbourne reserves the right to request for an allocated space to be removed or relocated at any time.

17.4.13 Agree to the performance detail reporting requirements summarised above.

18 The introduction of new car share models (which are alternative to the current fixed base models) may result in the City of Melbourne being required to review the recommended number of five new on-street car share spaces which will be approved each month (which equates to 60 spaces per year). New car share models which request privileged on-street parking agreements from the City of Melbourne and their associated allocation models will need to be approved by Council.

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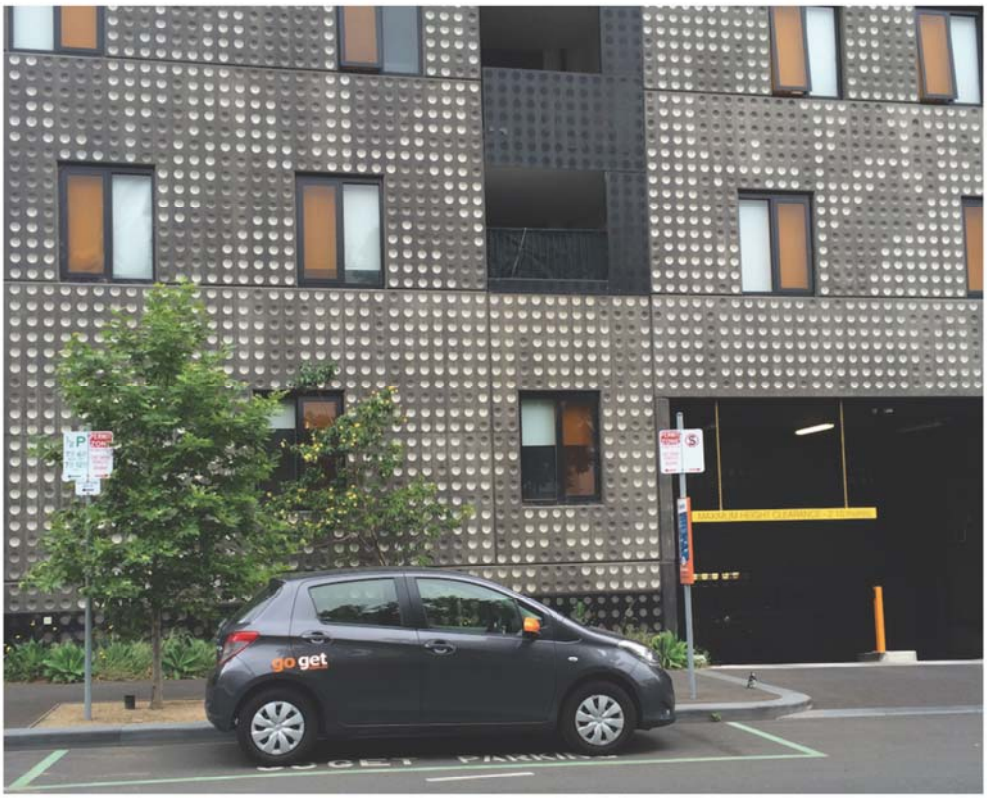
Car share services review

A review of car share policy in the City of Melbourne 2006 - 2014



City of Melbourne

18 June 2015

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Executive Summary

The City of Melbourne has a long-standing commitment to the support and encouragement of car share services for residents and business users in the municipality. At the highest level, this support comes under the broad policy direction articulated by the Lord Mayor that 'No great city in the world is trying to bring more cars into the city centre'.[1]

The City's support for car share was summarised in the *Transport Strategy 2012*. Priority Action 95 in the Strategy called for a review of car share policy in the City to 'ensure that it meets the objectives of the Strategy'. This review fulfils that requirement.

A broad suite of City of Melbourne land use and transport policies complement the commitment in the *Transport Strategy 2012* to 'support and enable the expansion of car sharing'.

To date the car share policy has been successful.

Currently around 5,518 City of Melbourne residents are using a fleet of 245 car share vehicles.[2] As a result, the resident vehicle fleet in the City is around 2,000 vehicles (6%) smaller than it would be without the network of car share services. The number of vehicle kilometres travelled in the City has been reduced by 4 million km per annum.

The scale of the car share network in the City of Melbourne is greater than in surrounding municipalities. However it is considerably less than that of comparable cities (such as the City of Sydney, where 800 vehicles have been deployed and 20% of residents enrolled). This comparison provides a window on the likely growth of car share services and potential additional benefits for the City and community.

The review considered Council's support for car share services at the *Strategic* and *Operational* levels.

Strategic level review

At the strategic level the review asked the question should the City accelerate, grow or maintain the current level of Council support for car share services. A fourth option – to reduce the support for car share services was not considered because the impact would be to reduce the current level of benefit to the community.

To answer that question the review considered the contribution, relevance and level of benefit that the car share service provides.

The review found that car share's primary impact reduces motor vehicle:

- Ownership; and
- Use; whilst
- Maintaining convenient access to a car for those who need it.

In essence the car share service contributes to maintaining liveability of the City despite increasing population and activity. This contribution comes in the form of each car share:

- Vehicle reducing the vehicle fleet owned by residents by nine vehicles
- Member reducing their annual private car travel by 50%.

This reduced level of car ownership and use has reduced road congestion, made parking spaces easier to find (and cheaper), enabled the City to make better use of built and open space, facilitated more efficient movement on roads, increased public health and improved household and local economies.

The review modelled these benefits and estimated the public and private value derived from the current fleet to be greater than $13m per annum.

The review modelled the costs of administering and providing for the car share service including an estimate of forgone revenue from parking meters. Even including every financial impact (including over-estimating some) on the City of Melbourne, the total cost of the current service to the City is estimated to be less than $3.8m per annum.

The City therefore gains a net benefit of around $9m each year from the current service and the project has a benefit to cost ratio of at least 3.4:1.[3]

This contribution and these benefits are directly relevant to a significant problem faced by the City as increasing population threatens to significantly increase the resident vehicle fleet.

An enlarged resident vehicle fleet will compete for a shrinking supply of storage and parking space (on and off street).

As is noted in the *Transport Strategy 2012*, constraints on Melbourne's transport system have contributed to a fall in productivity growth. If the resident vehicle fleet increases in size, it will increase the negative impact on productivity.

So far, growth in the car share service has not been sufficient to offset the growth in the residential car fleet, which has been about three times faster than the car share service.

It is recommended that the City of Melbourne adopt a strategic expansion approach to accelerate growth in car share services. This is the single most effective way of reducing the future residential vehicle fleet and vehicle kilometres travelled in private cars.

The target car share network size should be sufficient to avoid an increase in the resident vehicle fleet between 2011 and 2021. A car share service at this scale (2,000 vehicles) is considered technically feasible and would deliver a net benefit in the order of $45m each year.

The Draft Car Share Policy defines SMART[4] goals and targets. The goals are to:

1. Keep the number of private vehicles based in the City of Melbourne at or below 30,000 at the 2021 Census. (*No change from the 2011 Census*).
2. Keep the annual 'total vehicle kilometres travelled (VKT)' for the vehicle fleet based in the City of Melbourne below 120 million VKT in 2021.

In order to reach the goals the following SMART targets are set for car share services:

1. Enrol 30% of the population in fixed base car share services by 2021.
2. Establish a fleet of 2,000 Car share vehicles in the City by 2021.

Review of the location of car share vehicles and deployment decisions (including how to reach the strategic target) was undertaken in the *Operational* level review.

Operational level review

The operational level review considered issues anticipated by the *Transport Strategy 2012* and those that have arisen through the experience of implementing the current policy. These included targets, operating models and technologies, location guidelines and the pilot of car share locations in the Hoddle Grid. Consultation was undertaken with service providers, resident's groups, users, developers and neighbouring municipalities.

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The review found the operational level was working well and was on track to meet the fleet target set in the *Transport Strategy 2012*. It also identified a number of ways in which the approach could be evolved to maximise the community benefits and minimise the financial impact on Council.

To meet the recommended goals and targets the car share network will need increase by around 4% per month. Discussions with operators have confirmed this target is achievable.

The current car share policy applies to service providers that meet performance criteria and apply to be part of the Council car sharing network. The performance criteria are defined in Chapter 3.2 of this report. Car share service providers that can demonstrate that they meet these criteria (as determined by Council officers) can seek the support of the Council. Australian and international research has shown that fixed base services[5] meet these criteria.

The City only has direct influence on the service providers when they use Council controlled parking bays. This means the relationship is like a partnership. Within this context, this report outlines how the service providers would maintain a 'licence to operate' in order to access Council owned parking spaces. It should be noted that the City can generate significantly more community benefit from car share services if it maintains a partnership with service providers, most notably the City can ensure access for all residents through improved geographic coverage.

In addition the service providers will meet agreed benchmarks, provide data to the Council to assist in the development of sustainable services and assist to measure the overall benefits of the Car Share Service. The data will also be used prepare:

- A quarterly service performance report. This public report will show which sites are not meeting the agreed performance benchmarks and which are under review.
- An annual 'whole service' Report. This in-depth report will include assessment of progress towards the Targets, an in-depth report on the service as well an estimate of the benefits and costs of the service.

The City will seek widespread access to the services for all residents. To this end the City will work with service providers in a similar manner to how it works with other public transport providers.

As the service is a form of public transport, the City will not impose any levies. However, it reserves the right to charge fees in specific circumstances. When more than one service provider wants specific spaces, it is recommended that an auction be held – this is the most effective way of minimising financial losses to Council and maximising overall community benefit.

Vehicles will be located in consistent locations and in a way that minimises the displacement of other road users, maximises access for residential users and maintains transport system safety.

Deployment decisions will be taken quarterly with a focus on long-term certainty for customers, service providers and local communities. This will enable the establishment of a predictable process that maximises time efficiency and predictability for all stakeholders.

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1 Background

Since 2006, the City of Melbourne has supported the growth of car share services for residents and business users in the municipality. At the highest level, this support comes under the broad policy direction articulated by the Lord Mayor that 'No great city in the world is trying to bring more cars into the city centre'.

As well as illustrating the direction of the City's policies, the Lord Mayor's statement reflects the breadth of the policy support for car share. Policies in support of car share can be found in:

- High-level policy such as the MSS
- Land use and planning documents such as the Southbank Structure Plan
- Successive transport and mobility related policies such as the Transport Strategies and Road Safety plans
- Policies that address both land use and transport such as the CBD and Docklands Parking Plan 2008 - 2013
- Environmental policy such as Zero Net Emissions by 2020 (update 2014).

A detailed list of the formal policies and the clauses in those policies that specifically mention car share is provided in Appendix One.

At the same time that this range of policy support was being assembled, the car share policy and the operational guidelines for the management of car share have also been emerging. A key aspect of the policy emerged from Council deliberations in 2010 and 2011 when a trial of on-street car share in the Hoddle Grid was initiated.

The Transport Policy of 2012 Planning for Future Growth, summarised the car share policy and set a policy target: 'By 2016 a minimum of 300 on-street car share spaces are installed in the City of Melbourne, of which 50 are in the Hoddle Grid.'

This review of car share in the City of Melbourne comes at an appropriate moment. Ten years ago car share services were an unknown possibility to many residents, a speculative start up business idea and a new element of the City's systems for the Council to manage. Since then:

- Thousands of residents of the City have shown that the service is relevant to them and a substantial number rely on the car share services for motor vehicle based mobility.
- The service providers have emerged from the early start-up phase with strong customer bases and financially sound business models. It is likely that other companies will seek to join the first movers
- The City has gained in-practice experience managing the mode and of the impact that the service has on the availability of on-street parking
- Some cities internationally have grown car share services significantly and are reducing the negative impacts accociated with car ownership and use.

The City of Melbourne has commissioned Phillip Boyle & Associates to review the operation of Car Share Services in the City and draft an appropriate Council Policy regarding Car Share Services. This report is the deliverable for that project.

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2 Strategic review

2.1 ACCELERATE, GROW OR MAINTAIN?

The first question to be addressed by the review is whether the City has the car share service it needs for the next ten years, whether the service needs to be expanded and if it does need to be expanded, at what rate should it expand?

These questions can be encapsulated in three policy options:

- Accelerate: increase the service significantly in a process of 'strategic expansion'
- Grow: continue the current approach of 'responsive expansion'
- Maintain: suppress or slow the growth of the service and maintain the network at current levels.

The choice of approach will shape the policy and operational guidelines that the City adopts for the next period.

The three approaches described above can be seen in operation in municipalities around the world. However, since all three approaches are being implemented in Australia, local examples will be used.

2.1.1 Strategic expansion

In Australia, the City of Sydney has followed a path of strategic expansion. Both the City of Melbourne and the City of Sydney began to work with the emerging car share service providers around the same time. By 2014 the two municipalities have arrived at significantly different outcomes.

The City of Sydney increased the number of available share car spaces by 10 each month over a number of years. This growth in service availability reflected (and stimulated) a growth in membership. Today there are 800 vehicles available in the municipality and the membership is equivalent to 20% of the residents of the municipality.

Figure 1 below shows the growth in membership in the City of Sydney and illustrates the growing proportion of business members. These members use the share cars based in the City of Sydney during work hours. This enables the company to avoid the cost of a car pool. The business based use also means staff do not have to commute by car in case they need a vehicle during the day.

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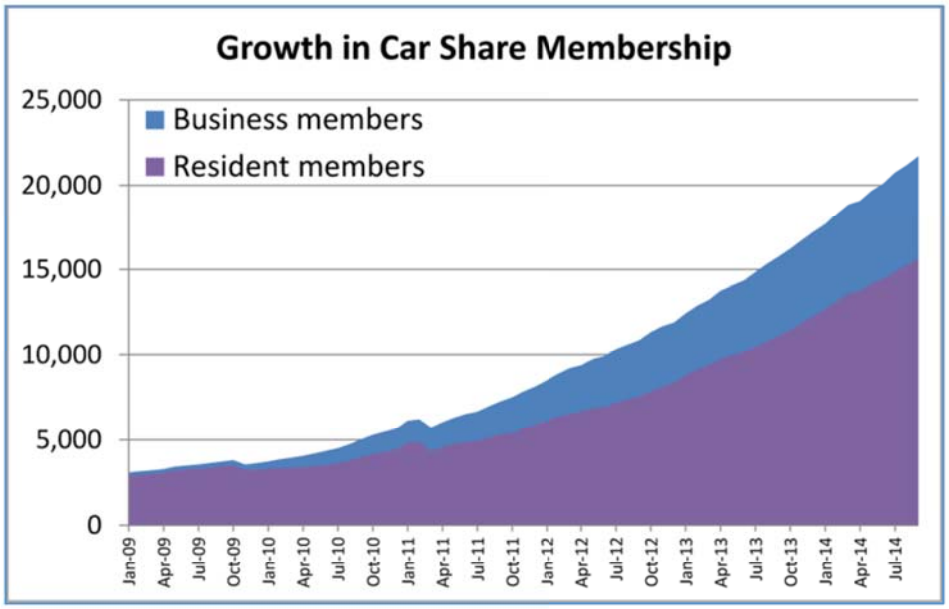
Figure 1: Sydney: Growth in Car Share Membership



2.1.2 Responsive expansion

Over the same period, the City of Melbourne's policy can be characterised as 'responsive expansion'. The City has set a service provision target – 300 vehicles – and has provided spaces at the rate and in the areas requested by the service providers. By June 2014 there are 245 vehicles available in the City of Melbourne serving 3,479 residents and 1,905 corporate members (around 4% of the residents). Corporate members are 35% of the total membership.[6]

2.1.3 Suppression

Over the same period, some of the City of Melbourne's neighbouring municipalities have followed a policy that can be characterised as suppression. Some, for example, have made ten spaces available each year. Some have made no spaces available over a number of years. In these municipalities, the only car share vehicles available to residents are on private land such as in apartment buildings. Other municipalities have called for applications for expansion but then refused to provide sites for the car share vehicles.

These approaches have suppressed the use of the services but have not stopped people wanting to use the service. In these situations, people who want to use the service 'cross the border' to car share vehicles based in neighbouring municipalities. The service providers have also sought to meet demand by locating vehicles in areas with no parking restrictions.

As a result, these municipalities have developed significantly smaller car share fleets and lower levels of membership in proportion to their population than the City of Melbourne.

2.1.4 The most appropriate choice

The Review has been unable to identify any characteristics of transport or land use that might lead to the differences in approach between the municipalities mentioned above. Nor are there significant differences between the high level policies of the municipalities relating to congestion and land use.

There is however, a substantial difference of opinion about the contribution and value of car share services. Municipalities that suppress the growth of the service take an 'in practice' position that the services are a commercial business rather than a community benefit. Supportive municipalities act on the conviction that the services, like commercial train, tram, bus and taxi services, are of some community benefit. Municipalities committed to strategic expansion have taken the view that the car share service is a form of public transport and has an important even a vital contribution to make to a sustainable and economically successful City.

To help the City of Melbourne choose the most appropriate approach for the next period, this review sought to clarify the nature and value of the benefit the services provide. If the services provide a significant benefit and provide a potential antidote to growth in car use, then the appropriate response is strategic expansion. If the benefit is of a lower order and the relevance is weak, then one of the other positions is more appropriate.

The Review now turns to analyse the:

- Contribution that car share services can make
- Relevance of this contribution
- Size of the benefit that can be derived from the contribution.

This assessment will enable the City to decide whether to accelerate, grow or maintain its support of car share services.

2.2 A MEANS TO REDUCE OWNERSHIP AND USE

The contribution that car share services make to the City derives from two factors. The ability of the services to reduce car:

- Ownership
- Use.

People who belong to a car share service have lower levels of car ownership and lower levels of car use than the general population. These two factors generate direct and indirect benefits for the City and the community.

2.2.1 How motor vehicle ownership is reduced

Share car membership enables residents (and others) to have immediate and convenient access to a car without the costs and inconvenience of ownership. Users of the service suffer no loss of mobility or opportunity and many find their transport costs overall are lower.

In general, half the members of a car share service reduce their vehicle ownership. The other half uses the service as an extra or back up vehicle in their household fleet. Since each shared use vehicle supports around twenty users – local residents and businesses – we can say that each car share vehicle represents ten cars that have been disposed of or avoided (for a net reduction of nine vehicles).

The lower levels of ownership are brought about in the following ways:

- People who have a car 'replace' it with a car share membership[7]
- People who do not have a car postpone or 'avoid' purchasing a car by using the service.

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2.2.2 How motor vehicle use is reduced

When City of Melbourne residents use car share vehicles rather than private vehicles, their annual kilometres travelled are reduced by 50%.

In general, a 'typical' motor vehicle in Victoria travels around 15,000km each year. However, vehicles based in the City of Melbourne do not get used as much. VISTA data suggests that the average use of a motor vehicle based in the City of Melbourne travels is around 4,000km a year.

City of Melbourne residents who are members of a car share service travel half that distance – around 2,000km each year. This lower level of use is brought about by behavioural factors relating to payment.

Vehicle owners generally do not factor in the cost of the trip before they make it. This is because their costs are sunk and the next trip is 'free'.

On the other hand, a car share service member has to decide whether to pay in the order of $15 an hour to use the vehicle. They perceive the next trip as a 'loss' alongside the gain from the purpose of the trip. It is well known that people are motivated to avoid 'losses' and this mechanism influences the decision whether to choose a car or an alternative mode in order to make the trip. In practice car share members find that they can switch 'every other' car trip to a walking, riding or public transport trip.

2.2.3 The impact of this mechanism

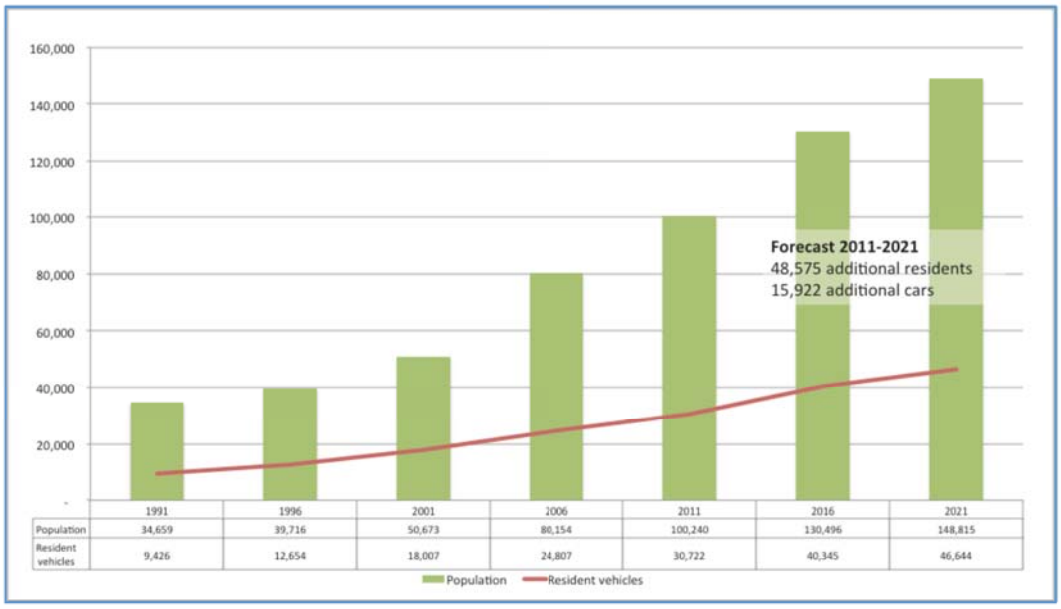
The ability of car share services to 'dissolve' car ownership and use without reducing people's convenient and immediate access to motor vehicles is an important mechanism that will enable the City to adapt to a rising population inside a fixed area.

2.3 THE CHALLENGE OF POPULATION GROWTH

By 2021, the population of the municipality is expected to grow by 50% (50,000 additional residents). This population growth will have a significant impact on the number of cars based in the municipality – the resident vehicle fleet.

If the car ownership rate remains as it is today, at 31 vehicles per 100 people, or 0.31 per person, we can estimate that an additional 16,000 vehicles will be based in the municipality, lifting the resident vehicle fleet to 47,000 vehicles. This growth in population and resident vehicles is represented in Figure 2 below.

Figure 2: Total Residential Vehicle Fleet and Total Population: 1991 to 2021

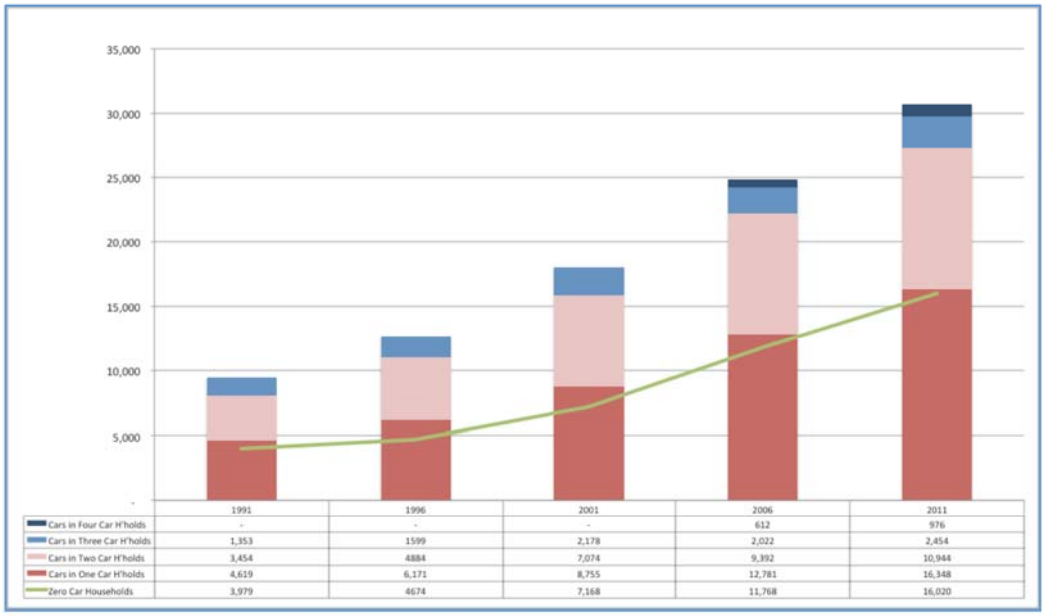


Sources: *Population; ABS Census Estimated Resident Population Resident Cars; 1991 to 1996 - id Profile, 2001 to 2011 - ABS Census, 2016 to 2021 - City of Melbourne (Geographia) 2014 Dwelling forecasts compared to the 2011 distribution of motor vehicles per dwelling*

By looking at the number of private vehicles per household it is possible to see the impact of the strategies that the City has put in place to influence the level of motor vehicle ownership of residents including the C133 zone and parking permit exclusions[8].

The number of vehicles based in households in the City of Melbourne is recorded by the ABS Census and shown in Figure 3 below.

Figure 3: Cars per Household: 1991 to 2021



Source: *Population; ABS Census Estimated Resident Population Resident Cars; 1991 to 1996 - id Profile, 2001 to 2011 - ABS Census, 2016 to 2021 - City of Melbourne (Geographia). 2014 Dwelling forecasts compared to the 2011 distribution of motor vehicles per dwelling.*

This figure shows the car-owning households in the City. Most car-owning households have one car – these households account for around half the resident fleet. The two, three and four car households make up the other half. Each of these categories is growing.

On the other hand, an increasing number of the City's residents do not own a car. In fact, there are more zero car households than one-car households and more zero car households than households with two or three cars combined.

It is likely that this growth in zero car households is due to the land use and transport policies and initiatives put in place by the City.

Important and effective as these policies are, they are not sufficient to stop the resident vehicle fleet growing significantly and undermining a wide range of the City's policies and aspirations.

If the City does not find and implement more effective responses, the resident vehicle fleet will continue to grow and the City will be faced with more severe storage, parking and road space problems.

2.3.1 Less space to store vehicles

Looking ahead it is likely that the amount of space available for car storage and parking will continue to diminish and there will be fewer on and off street parking spaces within the municipality.

While City's residential vehicle fleet is growing, the area or space available for storage and parking of vehicles inside buildings will reduce and become more expensive.

As the value of land in the municipality rises, lower-value uses such as parking structures are being replaced by higher value uses particularly apartments and offices. An apartment the size of two car spaces can sell for five times the price of two car spaces.

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

Other trends are reducing the off-street space available for parking:

- With the City's support[9], many new apartments are being constructed without car spaces
- The State "Congestion Levy" imposes a tax on commuter parking spaces that is stimulating some parking areas to be redeveloped into higher value uses.

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Figure 4: Car park at 224-252 La Trobe Street

There is less space for parking outside

The supply of on-street parking is also reducing. The CBD supply of on-street parking is half what it was in 1964.[10] On-street car spaces on high mobility streets and at popular destinations are being replaced by other higher value uses required for efficient function of the CBD such as loading zones, taxi zones, tram platform stops and wider footpaths. A recent example is the bus priority lane on Victoria Parade, which will replace at least 157 car parking spaces.[11]

On-street car spaces in residential streets are also being replaced by alternatives including pedestrian crossings, tree planting and storm water management. These higher value uses of space will further restrict the available kerbside space.

2.3.2 Limited road space

A larger resident vehicle fleet will be competing for the same amount of road space that is available today.

The maximum area available for driving motor vehicles within the CBD is unlikely to increase in the future. It is unlikely that the peak road network capacity can be significantly increased in the future. Even projects such as CityLink, Exhibition Street Extension and the Docklands road network, have only provided a relatively small increase in peak period road network capacity.

The access roads that lead to the CBD are already at capacity in peak times.

The area of road space available to move motor vehicles is likely to be reduced in some places. Road space in some locations will be reallocated to pedestrians who use the space much more efficiently and contribute more significantly to the economy.

Recognising the 'limits of supply' the City has successfully facilitated a change in the way people get to the City during the working week.

Cordon counts conducted since 2006 have counted around 50,000 private motor vehicles entering the City on a particular day. In 2006 these vehicles were 86% of the total. By 2012 the proportion had fallen to 75% and in 2014 the 50,000 private motor vehicles were only 70% of the vehicles passing through the cordon. This highlights that 30% of the vehicles are more productive types such as public transport and freight movements.

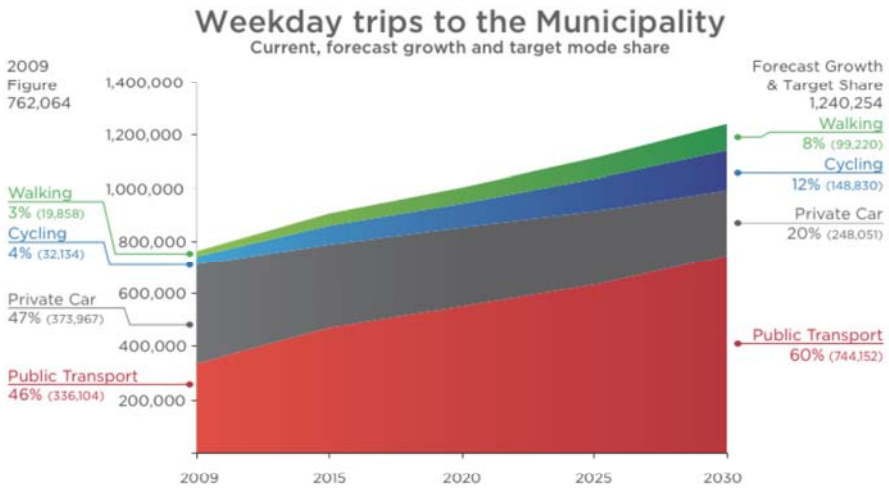
However, although the proportion of private motor vehicles has fallen, there has been no significant reduction in the number of motor vehicles. We can see that the City's policies are changing the mode share but so far, they are not cutting the absolute number of motor vehicles to make space for a larger resident vehicle fleet.

2.3.3 Mode and trip targets

A rise in the resident vehicle fleet is not consistent with the objectives of the *Transport Strategy 2012*, as it will undermine the City's efforts to meet mode share and trip targets.

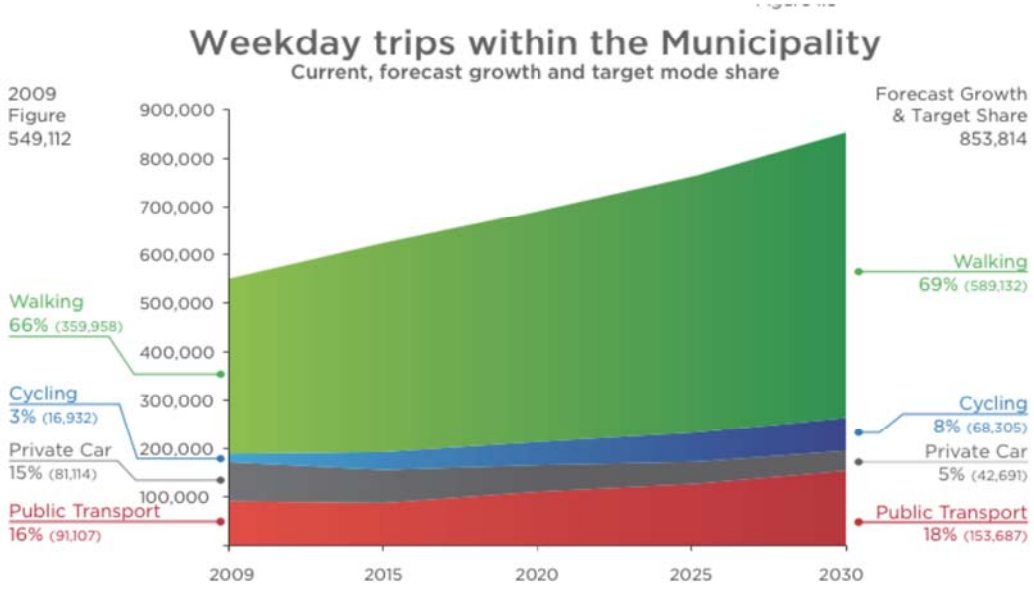
In the *Transport Strategy 2012*, the City set mode and trip targets for motor vehicles. The broad aim is to increase the number and proportion of weekday trips to the municipality by alternative modes and reduce the number of and proportion of car trips.

Figure 5: Transport Strategy 2012 mode targets: inbound



To achieve these Targets the City is implementing a suite of measures that make it more attractive to walk, ride a bicycle or catch public transport. The Transport Strategy sets similar targets for trips within the municipality.

Figure 6: Transport Strategy 2012 mode targets: internal trips



The 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 if the resident vehicle fleet grows. 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 from the 2009 figure rather than fall as intended by the Policy.

2.3.4 A relevant response to an significant problem

Any mechanism that reduces private car ownership and use is directly relevant to the challenges posed to the City's built form and road space brought about by a rising population.

Growing the car share service will enable the City to avoid a collision between the rising population and a rising vehicle fleet and the limited or shrinking space available on the roads and for parking and storage.

The next question is whether the benefits of a car share service are greater than the costs of 'assisting car share to flourish'.

2.4 ESTIMATING THE BENEFITS

The review sought to identify the benefit to cost ratio of support for car share services for the City of Melbourne.

The assessment identified four categories of value:

- Congestion impacts
- Public health impacts
- Environmental impacts
- Economic Activity impacts.

These categories group the key impacts associated with the use or avoided use of motor vehicles.

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1 The impacts of stored or parked cars (kerbside space)

A vehicle parked on the side of the road takes up space that could be put to greater use as part of the transport network (such as a traffic lane, bike lane, loading zone or footpath).

Kerbside space can also be used for items essential to the City of Melbourne's character and liveability such as shade or al fresco dining.

2 The impacts of stored or parked cars on economic activity (building space)

A vehicle stored in a building it takes up a 'cube' of space that could be put to a 'higher value use' such as shops, offices or places to live. As a rule of thumb, two car spaces in a building is equivalent to a single-bedroom apartment, four car spaces take up a similar area to a small retail store. Car parks inside a building are usually on the lower floors; the displacement of activity and overlooking has an impact on the streets around the building.

3 The impacts of cars use on congestion

When a vehicle is in use, it occupies a footprint of space on the road. This footprint is not used efficiently. On average, each car has 1.2 occupants.[12] An E-class tram that carries 200 people could use the road space taken up by less than five cars.

4 The impacts of car use on public health

When motor vehicles are in use they also emit harmful gases. Vehicles are 'cleaner' than they were, but these efficiencies have been swept away by the growth in the number of vehicles that are in use.

In addition, private car owners are less active and have lower health outcomes. Car share users switch trips to modes that require more physical activity than a car.

5 The impacts of car ownership on the household travel budget

Users of car share services find that they can cut their household transport budget substantially. Their 'alternative transport costs' rise but their motor vehicle costs fall. Other costs such as purchasing a car park with an apartment are avoided.

Research suggests that up to 80% of this 'surplus' is likely to be spent in the local economy. In general, people with lower proportion of motor vehicle trips are less likely to drive to where they spend the money and more likely to shop locally.

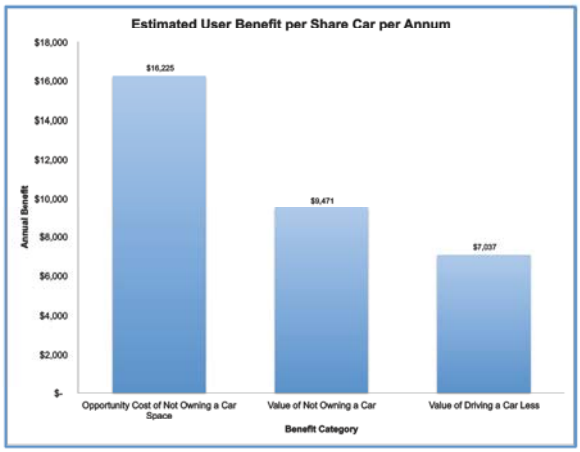
Using available and reliable metrics, the review has calculated the benefits that derive from these impacts. Where established measures were not available, the model identified the area of value but did not include it in the calculation. For example the estimate does not include the economic multiplier benefits or the social benefits derived from buildings with fewer car parks. These values are likely to be significant.

There is a detailed description of the model in Appendix Two. The calculations and factors used are in Appendix Three.

The following charts show the individual and community benefits that were estimated.

The analysis showed that the greatest value to the individual was the avoided cost of a car space. (It was assumed that five of the twenty users of a car share vehicle were able to avoid purchasing an off street car space.)

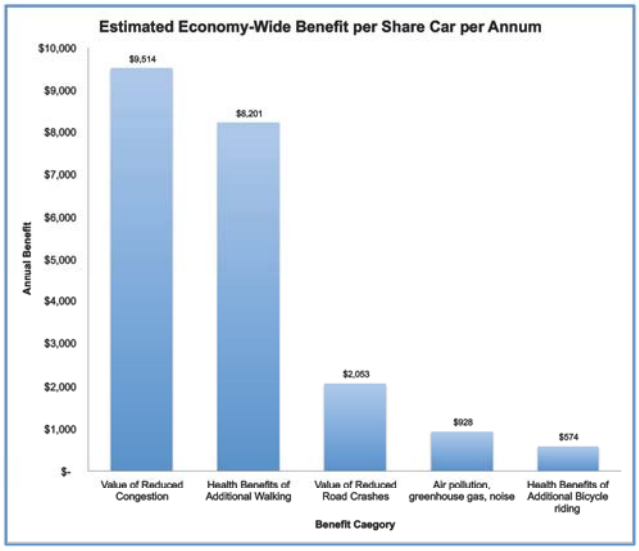
Figure 7: Estimated Annual User Benefit per Car share vehicle



Source: PBA modelling

The analysis shows that the value of reduced congestion is the most significant social benefit as shown in Figure 16 below.

Figure 8: Estimated Annual Economy-Wide Benefit per Car share vehicle



Source: PBA modelling

2.4.1 A cost benefit ratio

Against these benefits, the estimate placed the costs borne by the City. These include the infrastructure costs of marking out car share bays, administration and maintenance as well as the value of meter revenue forgone.

Most car share vehicles are in unmetered bays but some are located in metered areas. In the CBD some are in metered areas and others are in a context of loading zones or other uses. For the purposes of the estimate it was assumed that each car in the car share fleet across the whole municipality was in a high value metered bay that otherwise would be providing the City with $15,000 a year.

Even with such a conservative estimate of costs, the review found that the net benefit of each car share vehicle deployed is estimated to be $38,000. The Benefit-Cost Ratio is estimated to be at least $3.40 for every $1 the City of Melbourne spends (or revenue it does not collect) on car share services.

The net economic benefit of the car share service to the City of Melbourne community through the opportunity to make better use of built and open space, more efficient movement on roads, increased public health and improved household and local economies can be estimated conservatively at $9 million in 2014.

2.5 RECOMMENDED STRATEGIC APPROACH

The review can now return to consider which of the three approaches (accelerate, grow or maintain) are most appropriate for the City over the next policy period.

Currently around 5,500 people are using a fleet of 245 car share vehicles. As a result, the vehicle fleet based in the City is around 2,000 vehicles smaller (6%) than it would have been without the car share service.

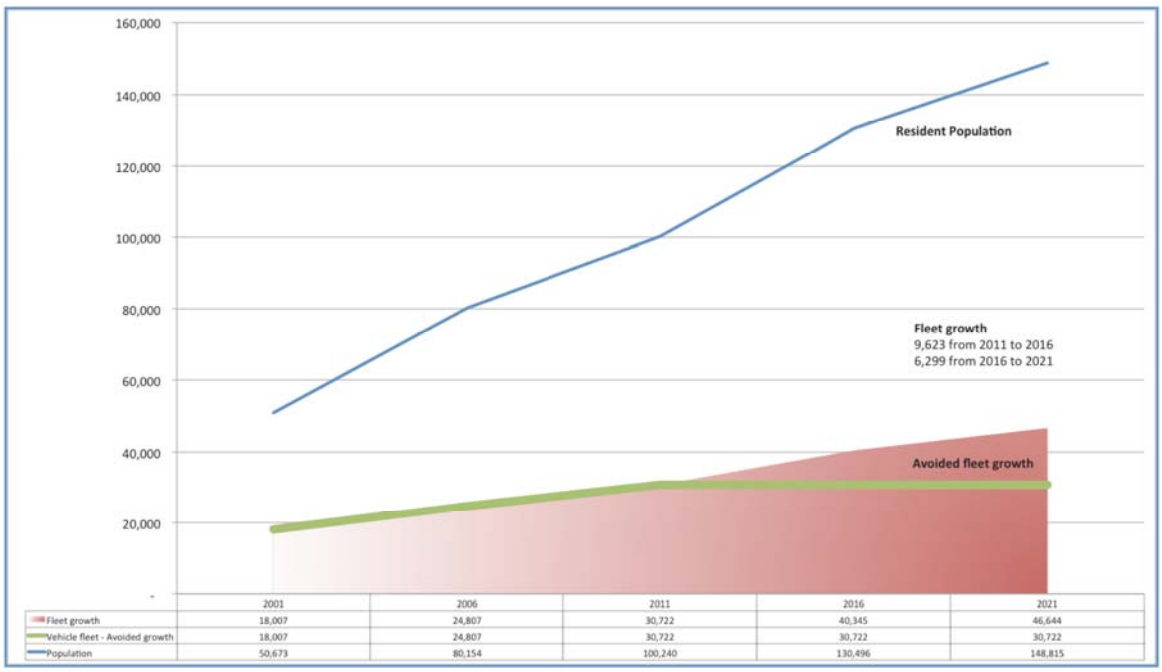
However, despite the number of 'avoided' vehicles, the resident fleet continued to grow between the 2006 and 2011 Census by 6,000 vehicles.

It is therefore recommended that the City choose to accelerate the growth of the car share service through strategic expansion over the next phase of its car share policy.

It is also recommended that a policy target be established to achieve a net zero increase in the residential car fleet (based on 2011 Census data).

Figure 9 below shows the population of the City growing (blue line) and the resident vehicle fleet remaining steady (green line). The area of red above the green line is the growth of the resident vehicle fleet (16,000 vehicles) that would be avoided if this approach is adopted.

Figure 9: Forecast Population Growth and Projected Impact on Vehicle Fleet



	2001	2006	2011	2016	2021
Fleet growth	18,007	24,807	30,722	40,345	46,644
Vehicle fleet - Avoided growth	18,007	24,807	30,722	30,722	30,722
Population	50,673	80,154	100,240	130,496	148,815

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2.6 CONCLUSION - STRATEGIC REVIEW

The current car share policy is meeting Council objectives and providing significant benefit to the City and its community.

Although the previous policy was consistent with a range of City strategies and had an operational target, the policy did not directly answer the question 'what problem are we trying to solve?'

The Review has identified vehicle ownership and total vehicle kilometres travelled as factors that can be directly and measurably influenced by the share car policy. In turn, the levels of vehicle ownership and the kilometres travelled by the resident vehicle fleet have direct and measurable impacts on the functioning and amenity of the City.

The Review found that there is a significant threat to the City's amenity from population growth and associated growth in the vehicle fleet. If the forecast increase of population in the City comes with historic levels of ownership and use, then the mobility and amenity values that are attracting people to the city will be eroded. This threat can be avoided through adoption of a policy that is focussed on addressing the threat.

The Review found that Council is the sole agency able to manage the car share service. This gives Council the opportunity to adopt an energetic and effective policy that supports and enables a further expansion of car sharing. If such a policy is adopted, the car share service will help Melbourne gain valuable benefits and avoid significant future costs.

It is recommended that the City of Melbourne adopt a strategic expansion approach to accelerate growth in car share services. This is the single most effective way of reducing the future residential vehicle fleet and vehicle kilometres travelled in private cars.

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3 Operational review

The operational guidelines and implementation framework that the City has been using to 'support and enable the expansion of car sharing' have been reviewed as part of this project. This is consistent with the direction in the Transport Strategy 2012.

This section provides an overview of key elements of the Operational Review.

3.1 REVIEW OF OPERATIONAL TARGETS

The operational targets of the car share policy were reviewed. In particular, the review considered current operational practice in the light of a Strategic Expansion of the car share service, as this approach, if it were chosen, would put the most pressure on the current system.

The current approach of Responsive Growth which adds fewer than five vehicles a month to the car share fleet will meet the fleet target set in the Strategy. The target is 'a minimum of 300 on-street car share spaces are installed in the City of Melbourne, of which 50 are in the Hoddle Grid' by October 2016 (the term of the 2012 - 2016 Melbourne City Council).

If a Strategic Expansion is desired, the rate of deployment will need to rise to 4% per month.

It is recommended that the next phase of the policy set a number of targets to complement a new fleet target including targets for the number of members in the scheme as a proportion of the resident population. A strong and effective service will grow in both members and fleet size.

It is also recommended that the operational targets include targets or guidelines that link the expansion of the service to the level of population and type of land use.

One of the consequences of a single fleet size target is that the service is not evenly spread across the municipality. In Kensington for example the membership rate and vehicle deployment is below average for the municipality. Another consequence is that vehicle locations are not always aligned with residential populations.

It is also recommended that the City track the benefits and costs of the initiative more closely and where possible increase the availability and reliability of data that underpins that assessment. This will involve tracking a number of measures including:

- Size of the resident vehicle fleet
- The number of vehicles avoided by the car share service
- Vehicle kilometres travelled (VKT) by the resident vehicle fleet
- The VKT of the car share fleet.

It is suggested that the recommended targets and performance measures be incorporated into Council's policy.

3.2 REVIEW OF OPERATING MODELS

The current City of Melbourne policy provides a framework for 'fixed-base' services. In this model, the City or a landowner allocates specific spaces in which service providers can park car share vehicles. The policy applies to all fixed-base car share services that require long-term use parking spaces that are owned, endorsed, enforced and/or formally marked by Council.

Under the policy, the service provider is responsible for ensuring that a car is available in that location, although the vehicle itself may be substituted from time to time to allow mechanical

servicing or by another type of vehicle that is more appropriate to the users in that location. For example, a small sedan may be replaced by a van or people mover.

Since the inception of the City's policy, a number of other short-term hire models have become available or have been prototyped. Innovation in this industry sector is continuing and future (even in the short term) operating models are currently unknown.

The review found some straightforward categories of car sharing businesses. Main elements for differentiating services include whether they:

- Provide a car without a driver (hire-drive) or a car with a driver (taxi)
- Require the user to return to its origin or whether they can leave the vehicle elsewhere
- Need on-street spaces owned and maintained by the City of Melbourne or use private land for parking vehicles.

Car share services covered by the existing policy are only those that answer yes to the questions above as illustrated in Table 1 below.

Table 1: Differentiating between various hire/share operating models

	YES	NO
Car without a driver	Hire cars (Avis, Budget, Hertz), Car Share (GoGet, Flexicar, GreenCarShare)	Taxi, Uber, Lyft, Town Car, Limousine Community mini bus, Hitchhiking
Return car to origin	Car Share (GoGet, Flexicar, GreenCarShare)	Hire cars (Avis, Budget, Hertz), Taxi, Uber, Lyft, Town Car, Limousine, Hitchhiking
Need on-street spaces	Taxi, Car Share (GoGet, Flexicar, GreenCarShare)	Hire cars (Avis, Budget, Hertz), Uber, Lyft, Town Car, Limousine, Hitchhiking

Source: PBA analysis

As the industry evolves the answers to these questions may change for some existing or new market players. Only those services that continue to answer yes to all three questions will meet the City of Melbourne's definition of a 'Car Share Service Provider'. Once this definition has been met, service providers would still need to meet other requirements in order to be eligible for assistance (exclusive access to specific on-street parking spaces) through the City of Melbourne's Car Share Policy. These requirements include proving that the system significantly reduces car ownership and use amongst the community.

The services that include a driver, such as limousines, taxis and Uber, are outside the scope of the review. The State is responsible for their overall regulation and their parking needs can be met by the existing parking systems such as taxi ranks.

There are a number of no-driver services in which users share vehicles. Traditional examples are hire car services typically found at airports. New and emerging businesses are based on peer-to-peer systems, with vehicles owned and managed by an individual. These are analogous to Airbnb through which people 'rent out' rooms in their private house. In future, the City's policy may need to cope with yet-to-be-invented operating models; it should therefore be focussed on the outcomes and economic benefits that each 'type' of service can provide.

The review found many municipal policies that enthusiastically supported car share but none that clarified exactly why a system should have the support of the municipality in a manner that allowed the City to endorse some systems and reject others. Under many of these 'first phase' policies, any business model that enabled people to share a vehicle would qualify. Sharing is not by itself sufficient reason for the City to put its weight behind a product or service.

In the context of rapid innovation and unpredictability of possible new systems, the City needs a simple measure in which the service outcomes (not the method of operation) determines eligibility. In addition, the burden of proof should lay with the service provider not the City.

Research and robust evidence from around the world demonstrates that fixed-base services (the type currently supported in the City of Melbourne) significantly reduce car ownership and use.

This is the highest value outcome for the City and it is recommended that these factors be used as the eligibility criteria. The services, including those yet unimagined, can qualify for the City's support by demonstrating that reduce ownership and use.

By following this approach, the City can stay focused on the desired outcome and remain agnostic to the ownership structure of the service provider, the capital asset arrangements of the service or the service features such as booking online or customer service.

3.3 REVIEW OF TECHNOLOGY

The review considered the role of technology in how the car share industry has originated and evolved. The review also considered how future technology might change the industry.

A range of 'red-herrings' is often connected to car share services because, as has been noted, the main contribution of car share services is frequently misidentified. Some car share policies have an environmental foundation for example. While there are environmental benefits from car share services, the economic analysis found these are not the most significant benefits.

One example of a technology 'red herring' is that of electric, small or high efficiency cars being used for car share services. Recently the City of Auckland requested a service be provided exclusively with 'electric cars'. This type of approach would be inappropriate for the City of Melbourne for a number of reasons:

- More expensive electric vehicles increase the financial burden on the services, raising the price for customers and eroding a key advantage over private ownership.
- Unlike electric cars in New Zealand, electric cars in Victoria would be fuelled by brown coal. When coupled with the increased resource (and emissions) from building the new cars (approximately 25% of the energy used over life or a vehicle is embedded in its vehicle manufacture process) the overall environmental outcome could be worse than using existing vehicles or even standard new vehicles.
- The current reluctance in the community to use non-standard vehicles. In the start up phase, Flexicar found that customers avoided the '*Daimler SmartCars*' in favour of typical motor vehicles. Depot hire companies in Melbourne have trialled electric vehicles in their rental portfolios but found that customers are reluctant to use them.

This review recommends that for the most part the City of Melbourne should not dictate which technology car share service providers, should use. The sector is evolving rapidly and is highly competitive (meaning that technology, points of difference and customer needs are being constantly considered by competing operators). Any such 'regulation' of the sector by the City of Melbourne would be just as likely to stifle growth in a service that is providing significant economic benefit to the City's community.

The City of Melbourne should instead focus on technology aspects that relate directly to the City's objectives and the car share service outcomes that generate the most significant economic benefit to the City. Specifically these are elements that reduce car:

- Ownership by increasing car share membership amongst residents and businesses
- Use by making active and public transport more competitive for many trips even if a car is still used for some occasional travel.

An aspect of technology that the review found should be included in future implementation of the car share policy is that of car space occupancy sensors. These can be used to better monitor car share vehicle use and ensure that car share service providers are supplying the type of service required by the community. They can also be used to confirm that data supplied by car share service providers (as part of their agreement with the City of Melbourne) is accurate.

3.4 REVIEW OF HODDLE GRID PILOT

The Car Share Analysis report January 2015[13] analysed the car share fleet across three zones: the Hoddle Grid, the rest of the CBD south of Victoria Street including Docklands, portions of Southbank and the balance of the municipality.

Nearly half (44%) the car share fleet is outside the Central City including Docklands and the CBD. These car share vehicles are all parked on street.

Nearly one third of the fleet is in the Hoddle Grid (69 vehicles, 28% of the fleet). Most of this fleet is off street. Only one third of the vehicles (21 vehicles 30% of the Hoddle Grid fleet) are in on-street car parks.

The third group of vehicles is in the balance of the Central City and Docklands (67 vehicles, 27% of the fleet). Of the vehicles in the outer ring of the Central City only one vehicle is based off street. Currently the car share vehicles in the Central City occupy approximately 3% of the on-street spaces in the CBD.[14]

This review considered the deployment of cars in on-street locations in the Hoddle Grid consistent with the commitment in the Transport Strategy.

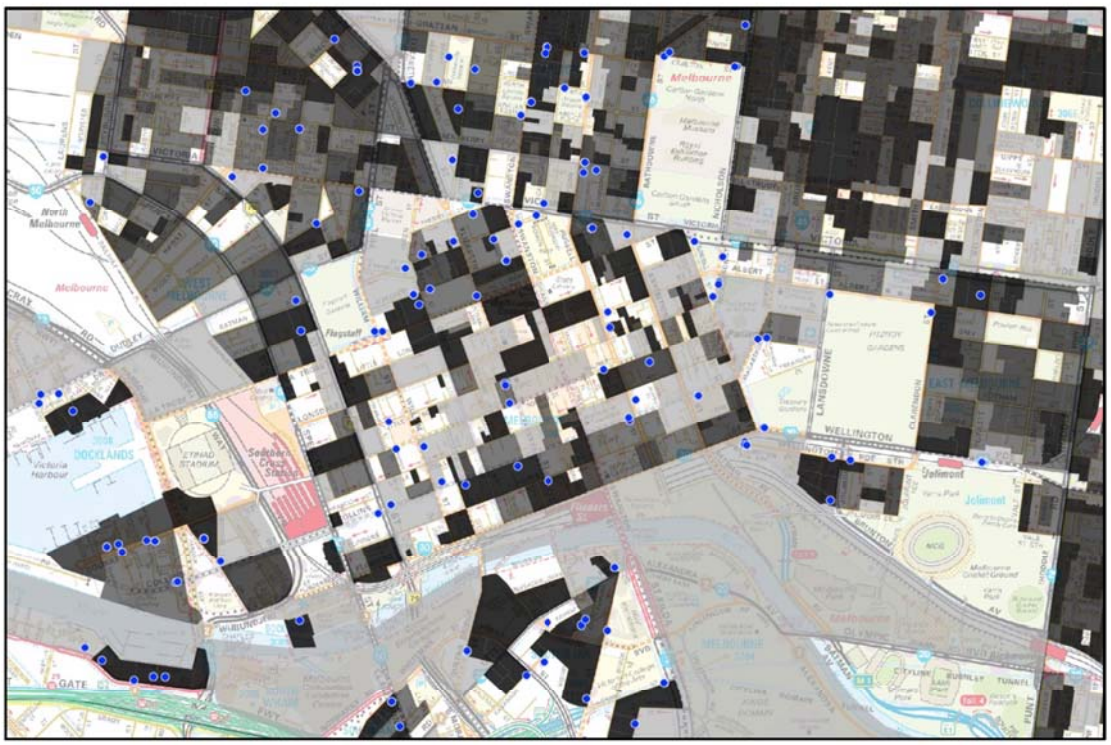
In 2011, 21 on-street spaces were provided in the Hoddle Grid – 7 spaces each to three service providers. Based on an Expression of Interest process the service providers were charged $3,000 per space per annum. This recovers 30% of the lost parking revenue, which was estimated at the time to be in the order of $10,000 per space.

The extension of the service to the Hoddle Grid has been a success. Aside from the vehicles in the Council's City Square car park, the on-street cars in the Hoddle Grid are the most heavily used in the car share fleets.

This success is due to the complementary customer markets that exist in the CBD. For example, business customers (35% of members) tend to use car share vehicles during weekday business hours and residents tend to use them in the evenings or at weekends.

The location of car share vehicles plotted against residential population in and around the CBD is shown in Figure 10 below.

Figure 10: Current location of car share vehicles in the CBD against resident population



Analysis of the current vehicle locations showed that vehicles have been located in both high and low density residential areas. The light areas in Figure 10 are those areas without residents.

The review also found that the locations that had been provided in the Hoddle Grid were not necessarily in the most appropriate locations when considering all the issues that the City has to balance. The location issues in the Hoddle Grid are of a similar nature to location decisions taken across the municipality and are dealt with below.

3.5 REVIEW OF LOCATION GUIDELINES

The *Transport Strategy 2012* made the commitment to 'continue to re-purpose street space to accommodate car sharing throughout the municipality' and committed to the 'allocation of City of Melbourne operated parking spaces to car sharing in the municipality's existing and emerging high-density, mixed-use areas. (Priority Action 94).

The current deployment process reflects the Responsive Expansion approach of the City.

Additional vehicles are deployed based on requests from car share service providers and the identification of appropriate sites by Council officers. There are no written priorities associated with the allocation of cars to specific neighbourhoods or guidance on where car share vehicles fit within the hierarchy uses for kerbside space.

This has resulted in car share vehicles being allocated space in locations that are highly sought after by a range of other road users (such as loading, taxis and short term parking) as illustrated in Figure 11 below. A more appropriate location would be in a space that is less 'contested' or desired by other road users

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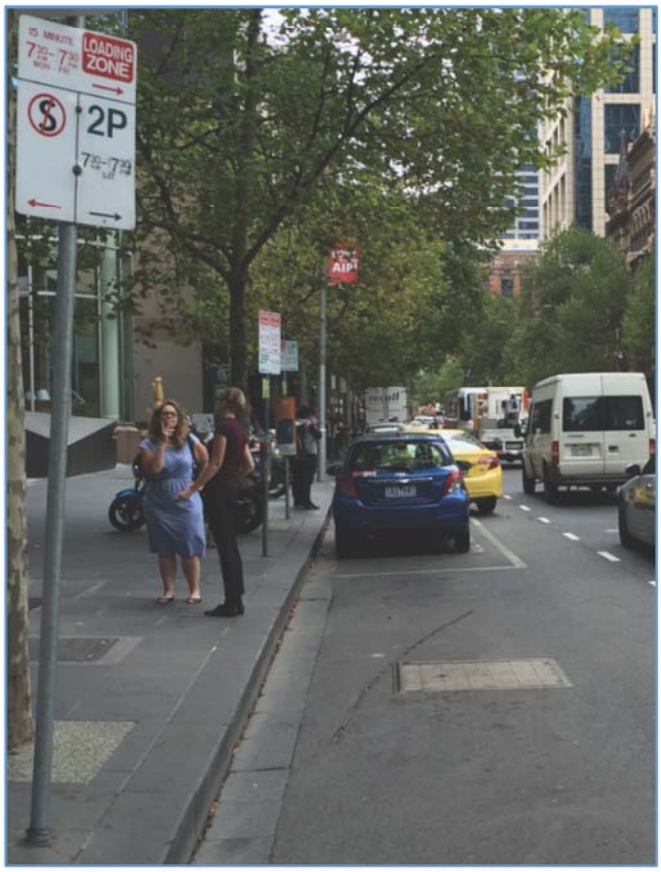
Figure 11: A Car Share Space in Collins Street east of King Street



Vehicle activity

On average, a car share vehicle is used 20 times a month. The average booking is for 6 hours. A typical booking includes two trips and 'wait time' – most bookings (72%) are less than an hour's drive (50km).

On this basis, a location with low parking turnover is appropriate, as even a 'busy' share car will be parked for many hours.

As noted above, the user has decided – despite the up front payment – that they need a car for this particular purpose and are prepared to walk a couple of hundred metres to reach it. Some users ride a bicycle or catch a tram to the car. For these reasons, locations such as in the central median are appropriate as shown in Figure 12 below.

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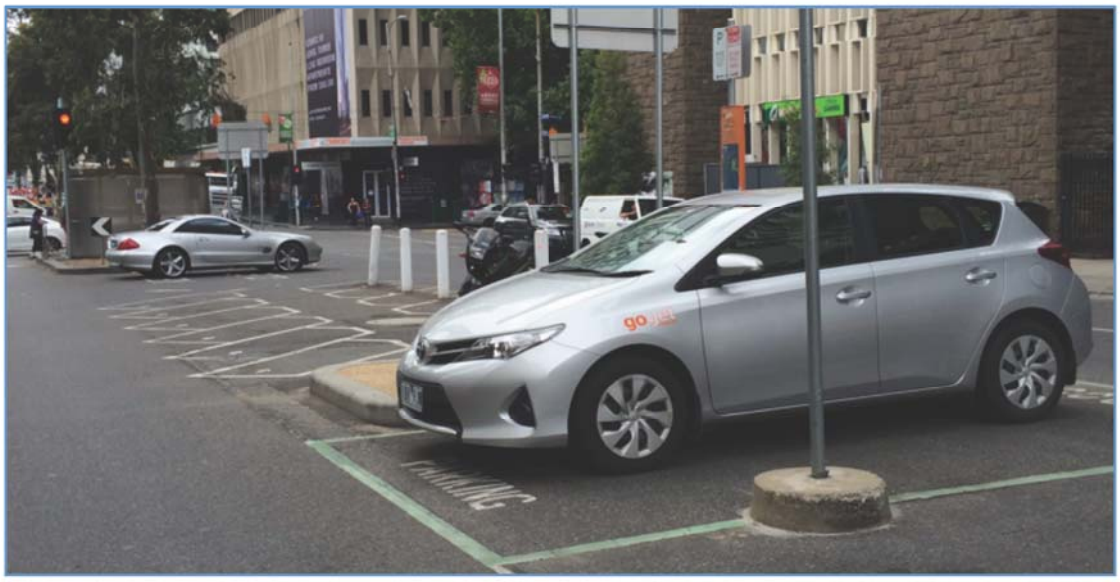
Figure 12: Car Share in central median (Franklin Street west of Elizabeth Street)



Location Principles

The Review identified a number of location principles that have been articulated in the Draft Implementation Guidelines. They include:

- Maximise the coverage of the system by locating vehicles in abutting 200m walking catchments
- Maximise the capacity of the system by co-locating vehicles in locations where demand is high
- Maximise the walking catchment by locating vehicles at or near intersections
- Minimise time in congestion by locating vehicles near arterial roads. For example in the Hoddle Grid there should be vehicles near 'exits' such as Flinders Street West and Batman Avenue
- Avoid kerbside locations if possible. Centre median parking is appropriate for car share but inappropriate for loading zones and disabled spaces. Centre median locations should be used for car share where they are available.

3.6 REVIEW OF FEES AND CHARGES

The review considered the fees and charges that the City requires of car share service providers who currently pay for parking permits and a levy for spaces in the Hoddle Grid as discussed above. No parking space levies apply outside the Hoddle Grid.

On one hand, the City manages parking space in a way that generates revenue for the City. Fees and charges have been applied to the services on the assumption that Car Share Service providers need to pay reasonable costs associated with their business and should compensate Council if their business significantly reduces Council revenue.

On the other hand, the Council is the mode manager of car share services and seeks to manage the mode in a way that maximises community benefit. The Transport Strategy 2012 is unambiguous in including car share services in the category of public transport.[15] In general, these services are exempt from fees and charges. Rail and tramway operators do not pay rates to

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Council for the land their tracks occupy nor does the taxi industry compensate Council for the lost revenue from parking metres that could otherwise be installed in taxi parking zones.

From a mode management perspective, the imposition of fees and charges would not be appropriate.

These two assumptions meet in the management of parking space. The City uses the meter system to raise revenue from some uses while simultaneously restricting other uses from the space. A third factor is the variation in price from location to location.

The combination of these three factors – mobility management, revenue raising and variable pricing – can be seen in this chart. A number of uses have been exempted from paying for on-street parking because of the contribution they make such as congestion relief as shown in Figure 13 below.

Figure 13: Charges for central city parking space for a range of users

LOCATION OF ON-STREET SPACE	TRAM/ BUS STOP	CAR SHARE	TAXI ZONE	LOADING ZONE	COMMUTER	SHOPPER / ON BUSINESS	RESIDENT
Hoddle Grid	$0	**$3,000**	$0	$0	*Not permitted*	**$15,000**	*Not permitted*
Albert Rd (just outside Hoddle Grid)	$0	$0	$0	$0	*Not permitted*	**$7,500**	*Not permitted*
Wellington Parade Sth (just outside Hoddle Grid)	$0	$0	$0	$0	**$2,000**	**$2,000**	$20
Residential area	$0	**$80**	$0	$0	*Not permitted*	*Not permitted*	$20
Non-metered space	$0	$0	$0	$0	$0	$0	$0

Note: Estimates of value and return per annum are rough averages that will vary based on site conditions, principles for calculation of the averages have been based on City of Melbourne's Parking Strategy.

The 'value' of a space is difficult to assess in part because the price set by the City of Melbourne for each metered space is often less than the potential financial return that could be generated from that space if it was 'valued' at a market rate as illustrated in Figure 14 below.

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Figure 14: Market value of on-street parking space

LOCATION OF SPACE	ACTUAL VALUE OF SPACE (MARKET RATE P.A.)	MAXIMUM RETURN P.A.
Hoddle Grid	$25,000	$15,000
Albert Rd (just outside Hoddle Grid)	$15,000	$7,500
Wellington Parade Sth (just outside Hoddle Grid)	$15,000	$3,000
Residential area	$3,000	$150
Non-metered space	>$1,000	$0

Note: Estimates of value and return per annum are rough averages that will vary based on site conditions, principles for calculation of the averages have been based on City of Melbourne's Parking Strategy.

Setting the rate of a parking space levy for car share vehicles needs to take these factors into account as well as the mode management risks faced by the Council which include:

- That the City's policy will be inconsistent by requiring some public transport operators to pay a levy.
- That the car share service will be suppressed if fees make it unattractive to use the service and uneconomic to deploy vehicles.
- That suppressing the car share service will trigger external costs as identified above in the benefit cost assessment

Before setting the rate of a levy, it would be appropriate to model the impacts of car share vehicles that displace meter parking in order to avoid these risks and establish confidence in the approach that is adopted. This is recommended in Further Work below.

3.7 COMMUNITY CONSULTATION

A stakeholder engagement workshop was held in February 2015 with 38 community representatives and stakeholders invited. Invitees were drawn from the City of Melbourne's Community Relations Team database as well as car share members, property developers and owners corporation management companies. Ten external stakeholders attended this workshop comprising representatives of local resident groups, retail trader associations, developers and car share service users. The workshop included an overview of car share and the intended policy direction as well as a request for feedback on the local impacts of additional car share spaces.

Reactions to car share were strongly positive, particularly regarding the potential for car share to reduce private car use and complement the continued growth of the City's population. In particular, the potential for car share to complement public transport, cycling and walking without the resulting car ownership was seen as a significant benefit. Car share was seen as a public good that was deserving of the City's support, provided adequate performance monitoring was in place and local impacts were monitored.

Some concerns were expressed about the careful of management of contested space, such as car spaces outside retail premises, which are highly valued due to their high value as high-turnover short-stay spaces. Accordingly, stakeholders flagged a preference for locating car share spaces in residential areas, both within developments or parking garages and on-street. It was also recognised that some developments, such as heritage buildings may not be able to accommodate share car spaces so there would be a continuing role for on-street spaces. Stakeholders were supportive of an active role for Council in managing car share, particularly to ensure on-street spaces do not under-perform.

Concerns about service coverage (ensuring that car share vehicles are deployed equitably across the municipality) and appropriate and maintaining revenue from on-street parking meters were less important to the stakeholders involved. This is generally because they tended to agree that an implementation strategy could ensure Council obtains fair value for certain spaces (such as in the CBD) and influence location of vehicles in areas that would otherwise be un-financial (such as Parkville) through pricing and ballot processes.

A workshop was also held for local government staff from the City of Melbourne and all adjoining municipalities Telephone interviews were conducted with operators (including some yet to commence operations in Australia) and the Cities of Darebin and Moonee Valley.

3.8 CONCLUSIONS FROM THE OPERATIONAL REVIEW

The current process for deployment of the car share fleet as required by the *Transport Strategy 2012* has been satisfactory:

- The rate of deployment has been appropriate for the fleet target
- The operating model and technology are appropriate
- The locations chosen have been satisfactory and the deployment of vehicles in the Hoddle Grid has facilitated the most successful locations in the municipality.

However, it is appropriate that the Policy and Implementation principles and procedures are evolved for the next phase, especially if the car share service is to be expanded.

These Draft documents address the operational issues anticipated by the Strategy or that have arisen through experience implementing the policy.

It is recommended that the City evolve its approach from 'giving permission' into the role of 'mode manager'. Specifically the City should:

- Identify appropriate roles and tasks for the City as 'mode manager' and for the service providers
- Provide a performance-based definition of car share services that enables the City to assess the eligibility of services that addresses the issues of eligibility for support for existing and innovative services
- Define a partnership based on a series of mutual obligations including communications and promotion to support the growth of car sharing
- Define the performance and reporting obligations of the service providers as well as appropriate fees in a process analogous to other public transport service monitoring
- Develop appropriate definition and division of responsibility and effort between the service providers and the Council that eliminate inefficiencies on both sides of the partnership
- Emphasise the importance of facilitating the garaging of a significant proportion of the car share fleet off-street while remaining available to the general public.

A similar evolution is recommended to formalise implementation guidelines that includes:

- A process that can guide deployment based on the underlying land use as well as the growth of the services
- Principles to guide the location of vehicles in the various areas of the municipality including consideration of issues in the Hoddle Grid such as the implications of revenue loss
- A clear process for allocating parking spaces
- An emphasis on the importance of facilitating the location of vehicles in spaces that are not operated by the City of Melbourne.

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4 Further work

This policy is prepared at a time when the City is exploring the role of Mode Manager of a relatively new type of transport service. This Review identified a number of ways that this task can be supported.

The following further work is identified:

- Assessing whether new services such as free-floating services like Car2Go meet the criteria of the policy (this would only occur for those service providers that request a 'license to participate' with appropriately detailed research)
- Assessing whether some or all of the City's car fleet can be based on car share services
- Developing Practice notes for non-standard bays
- Developing an Annual Deployment Plan to guide the process of Deployment. This Plan would provide applicants and decision makers:
  - With an outline of an efficient and effective process by which sites were allocated, reviewed, relocated or withdrawn
  - Guidance on which areas and locations are likely to be successful
  - Location specific information based on the above policy principles
  - Clear definitions of responsibilities and duties
- Exploring how the City can support recruitment and promotion of the service
- Exploring how the City can catalyse change in the development practice and stimulate retrofits that enable the services to base cars in off-street locations available to the public
- Exploring how the City can help service providers have early input to and notice of developments that are required or intend to provide space for them
- Developing more robust measures of the benefits of the service including:
  - The impact of the fixed base services on car ownership and VKT and other related behaviours of car share users
  - The value of avoided parking in buildings – Spatial Value
- Exploring an exemption at off street sites for a waiver of the Congestion Levy
- Establishing a hierarchy for the competing uses of kerbside space
- Modelling the revenue and mode management implications of car share vehicles that displace meter parking.

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Appendix A: Policy Background

A.1. POLICY CONTEXT

The City of Melbourne Car share Policy is part of a constellation of polices including:

- High level polices:
  - The Municipal Strategic Statement
  - Melbourne City Council: Council Plan 2013 – 2017
- Transport related policies:
  - The Transport Strategy Planning for Future Growth 2012
  - Zero Net Emissions by 2020 update 2014
  - Road Safety Plan 2013 – 2017
  - CBD and Docklands Parking Plan 2008-2013
- Land use policies:
  - Melbourne Planning Scheme – Maximum Car Parking Rates
  - Southbank Structure Plan 2010 and other structure plans

These and other polices stress the need to reduce the negative impacts that result from car ownership and use. A key method to reduce these impacts is to reduce the level of reliance that residents have on cars.

A detailed analysis of the relevance of each policy to car share services has been undertaken. The key elements include:

- The Transport Strategy 2012 sets mode share targets that equate to an:
  - 18% reduction in motor vehicle trips to the City by 2020
  - 11% reduction in motor vehicle trips within the City by 2030

The City of Melbourne Planning Scheme specifically refers to car share services as a significant opportunity to achieve higher quality urban environments while maintaining access to private motor vehicles.

Zero Net Emissions Strategy specifically refers to car share services as something that should be developed and supported by the Council.

- The Road Safety Plan refers to installation of car sharing facilities throughout various parts of the City as a key success of the previous safety plan
- At the local level implementation documents such as the Southbank Structure Plan state that car sharing should be expanded through the provision of additional on-street car spaces and the provision of spaces within private developments.

There are no council policies or State government policies that actively seek to reduce or restrict car share services. The only policy element of this sort is the existing policy related to locating car share spaces in the Melbourne CBD, which is aimed at minimising disruption to on-street parking (from the perspective of both availability and revenue generation).

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A.2. POLICY REFERENCES TO CAR SHARE

The following policies were considered most relevant in their references to car sharing services.

The Municipal Strategic Statement (part of the City of Melbourne Planning Scheme)

In clause 21.09 the Municipal Strategic Statement (MSS) specifically mentions the role of car share services, thus:

> *Private motor vehicles will continue to be part of the mix of modes available for city users but their use will be developed to be more complementary with the other modes and more compatible with good quality higher density inner city living and working. Car sharing is one significant opportunity for achieving this.*

The MSS also includes two objectives related to private motor vehicles that provide a context for the car share policy'[16]:

- To encourage more efficient use of private motor vehicles
- To reduce the negative economic, social and environmental impacts of traffic and parking, particularly on residential areas and parklands.

The City of Melbourne Planning Scheme also provides for a maximum rate of parking allowed to be provided in CBD office buildings and a maximum rate of car parking allowed to be provided for apartment buildings.

The Transport Strategy 2012 - *Planning for Future Growth*

The Transport Strategy anticipates that 'the role of the car will change to a niche mode for specific journeys' and sets high-level mode share targets that aim for a reduction in car use:

By 2020

- 90 per cent of all commuter trips to the CBD will be by public transport, cycling or walking — the 2006 journey to work census figure was 72 per cent.

By 2030

- 80 per cent of all trips to the City of Melbourne will be by public transport, cycling or walking — the latest Victorian Integrated Survey of Travel and Activity (VISTA) 2009 figure is 50.9 per cent.
- Bicycle use will increase by 400 per cent from 4 per cent to 12 per cent of all trips.
- 95 per cent of all trips within the municipality will be by public transport cycling and walking — the latest VISTA 2009 figure is 84 per cent.

The Strategy expects these high level targets to deliver more efficient use of road space:

> *Improving efficiency reduces the cost to the community per trip as faster trams and buses can do more journeys, moving more people and providing a more frequent service without the need to buy new vehicles.*

The Strategy also refers to the competition for on-street parking space:

> *the stock of on-street parking has been falling however, as road space is re-allocated for higher efficiency road uses such as wider pedestrian paths, bicycle lanes and bicycle parking and better tram stops. This trend will continue as city activity intensifies and expands, and so will the demand for car parking spaces.*

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> *A new level-access tram stop which provides access for around 12,000 people per day is equivalent in area to 40 on-street parking spaces, which provide access for only about 480 people per day. The new stop also increases the speed, reliability and comfort of the tram service.*

The Strategy refers to the lower value use represented by off-street parking:

> *To avoid the costs of basementcar parking there has also been a recent developer trend to provide this off-street parking in multi-level above ground. This is resultingin developments where up tothe first 10 levels of the building are car parking, presenting a 'dead' frontage to the street and fostering a lifeless streetscape.*
>
> *There is an opportunity for new parking capacity to be constructed so it can be converted to other more productive uses if it is not needed for car parking in the future.*

The Strategy refers to the cost of motor vehicle ownership

> *The purchase, insurance and maintenance of the vehicles and fuelling them (oil and electricity) will continue to grow as a major business and household cost. This will likely drive a shift to more economic patterns of driving, such as priority access for delivery and service vehicles, smaller lighter vehicles and car sharing.*

The Strategy refers to the Zero Net Emissions by 2020 (Update 2008) policy, which established a 20% reduction in carbon intensity for the public transport sector.

In Chapter 10 the Strategy addresses Car share services in detail.

Key direction 4 of the Strategy states the objective to '*Develop high mobility, pedestrian and public transport streets in the central city*' and sets the Policy Target of '*a minimum of 300 on-street car share spaces are installed in the City of Melbourne, of which 50 are in the Hoddle Grid.*'

The strategy reviews the growth of the services and committed the City to continue to 're-purpose street space to accommodate car sharing throughout the municipality.' It noted that 'The role of local government in supporting car sharing can also extend to marketing and communications channels, and providing information about the benefits of car sharing to the community.'

Priority actions were determined including the development of this policy regarding car share services[17]. The Strategy also imagines car share as part of better public transport information systems that are managed in an integrated manner.

CBD and Docklands Parking Plan 2008-2013

This plan was formulated in a previous strategic context including the VicUrban Charters and the City's *Moving People and Freight – Transport Strategy 2006 – 2020* which 'found that the challenge for Melbourne is to progressively reduce unnecessary car traffic (and the associated demand for car parking) and give priority to the use of road space for commercial access, energy and space efficient vehicles (such as motorcycles, scooters), walking, cycling and public transport. '

The Parking Plan predicted:

> *Beyond the next five years, there will be increased pressure to put in place local measures in support of environmentally sustainable forms of transport and improve pedestrian amenity within the CBD and Docklands.*
>
> *The City of Melbourne provides some parking spaces for car-share vehicles and the demand is likely to grow especially if the price of petrol continues to increase and more families make the decision not to keep a second car.*

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And noted the following on Car share services:

> *The City of Melbourne provides car parking spaces free of charge to car share operators, recognising that businesses need to be supported in a start-up mode. As the businesses gain critical mass they will have greater demand for car spaces and will also have the ability to pay for the spaces used by the business. The City of Melbourne will consult with providers about whether or not to charge for dedicated use of the parking space in the future. A protocol will be documented which illustrates how private businesses which meet City of Melbourne policy objectives may be supported through the allocation of dedicated car parking bays. This will ensure future requests are made and assessed in a transparent manner. The next step to implement this initiative is to draft the protocol document and discuss the draft with key stakeholders.*
>
> *One further option in the future would be for the City of Melbourne to introduce a requirement for new residential buildings of sufficient size to provide space for car share vehicles to be parked. This would help to ensure that the price of dwellings is not inflated by the additional cost of providing car parking in each building. It would also help to establish a market for services that cater for people without ready access to a car. Innovative solutions such as this one require further investigation.*
>
> *Recommendation 29 – that the City of Melbourne establish a protocol for supplying spaces to car share scheme operators*

Zero Net Emissions by 2020 update 2014

This Strategy endorses mode shift from private motor vehicles: '*Public transport, walking and cycling will be the predominant local modes of inner urban travel.*' The Strategy specifically recommends the City '*Develop and promote vehicle sharing initiatives.*'

Road Safety Plan 2013 – 2017

The Vision of the Road Safety Plan picks up a number of the themes mentioned above including physical activity and repurposing space:

> *The prioritisation of the needs of people, particularly for walking and cycling, has helped to embed greater levels of physical activity in people's lives. The reallocation of a number of urban spaces previously used for the movement of traffic and for car parking, has been converted to green space, supporting the City of Melbourne's Urban Forest Strategy. The creation of more green space has helped to reduce the urban heat island effect, create sustainable urban drainage and improve air quality.*

And reducing car ownership and use:

> *The prioritisation of the needs of people has resulted in a significant reduction in the level of car dependency, car ownership and use, eliminating many unnecessary car trips to and within the city. More people are walking, cycling, motorcycling and using public transport, helping to reduce congestion and pollution.*

It records as one of the successes of the previous road safety plan is the '*installation of car sharing spaces in numerous locations in the municipality*'.

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Southbank Structure Plan 2010

The Southbank Structure Plan 2010 reflects on the land use and built form cost of providing parking in buildings:

> *Streetscapes made up of buildings with large footprints, inactive ground levels and car park filled podiums have created a dead and intimidating public realm lacking in activity and natural surveillance. Within Southbank 83% of all street frontages are inactive. This inactivity reduces the security, vibrancy and attractiveness of the street and makes Southbank a poor walking environment and a cold and unfriendly place. '*
>
> *'Any car parking included in the podium should be constructed with a minimum 3.6m floor-to-floor heights to allow for future adaptability to other habitable or commercial uses.*

With regard to mobility objectives it notes:

> *On a day-to-day basis, many workers and residents already exhibit low levels of motor vehicle dependency. The Structure Plan 2010 must build on this strong foundation to achieve even higher levels of sustainable transport.*
>
> *The specific objectives that support the creation of a sustainable and fully integrated multi-modal transport system for Southbank with a central city standard of mobility, access and connectivity include:*
>
> *'Accommodate local car access and circulation while targeting a reduction in car ownership and use.*

With regard to mobility and access strategies is includes:

> *Encourage the expansion of carsharing operation through the provision of additional on-street spaces and the encouragement of off-street shared spaces within private developments. This will reduce the need for additional car parking spaces within new developments.*

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Appendix B: Economic Evaluation

B.1. BENEFITS

Reducing motor vehicle ownership and use releases four categories of value:

- Public realm value
- Mobility value
- Public health value
- Economic multiplier.

These are discussed individually below.

4.1.1 Public Realm (Spatial) value

Reducing motor vehicle ownership releases spatial value through reduced:

- Car usage (VKT)
- Car parking that enables increased activity and high amenity of the public realm.

Car Usage (VKT)

Every kilometre travelled in a car has an impact on the public realm in terms of creating urban barriers (such as City Road), loss of habitat (trees and vegetation links), soil, water and landscape degradation. These impacts have been quantified in dollar terms by specific research and published in the Australian and New Zealand guidelines for transportation system management. The rate of impact is around one cent for each vehicle kilometre and the cumulative total impact is an economic one (not financial) borne by the community as a whole.

Occupancy and alternative uses

Demand for parking inside buildings is directly proportional to the activity in the local area. In particular demand for car parking is specific to the activities operating at specific times of day in the area surrounding the car park. The land area taken up by car parking reduces the economic activity that can otherwise occur in the local area (in the form of residential, commercial or retail activities).

Car parking facilities tend to be built based on speculative demand with a view to meeting peak demand requirements. This means that in most cases the total car park is rarely fully occupied. The space that is unoccupied 90% of the time is an opportunity cost in that it could be used for more productive activity that contributes to the local economy. Quantifying the opportunity cost in each situation is a time consuming task, as it requires specific insight regarding the activities suited to the local area and economic conditions. This analysis has not been included in the economic model.

Over time, resident needs and travel choices change. The Southbank Plan Structure Plan (see below) notes that car spaces inside buildings should be built in a way that allows them to be repurposed as commercial or residential. This adds to the initial cost of providing the parking space, but makes it possible to reuse the space if demand for car parking in the building reduces.

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The public realm can also be compromised by car storage inside buildings. The Southbank Structure Plan says that buildings with ground level parking 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.'*

Outside the building, lower levels of private vehicle ownership reduce demand for on-street parking and enable the public realm (road reserve) to be used for other purposes. The City has replaced car parking spaces with footpath widening, street trees, bicycle racks and commercial uses such as al fresco dining. For example the repurposing of car parking spaces in Errol and Courtney Streets enabled the establishment of the Errol Street Reserve in North Melbourne.[18]

The value of this alternative use of the space has not been included in the economic model as it would require significant primary research to quantify with appropriate certainty.

Summary

A summary of the spatial benefits included (and not included) in the economic model is provided in Table 2 below.

Table 2: Summary of Spatial Benefits

ITEM	INCLUDED IN MODEL	UNIT RATE	NOTES
VKT impact on urban amenity & environment	Yes	$0.0113 / VKT avoided	Accounts for nature, landscape and urban barriers
Value of alternative use inside buildings	No		Could duplicate financial impact on users and economic multiplier
Value of alternative use of kerb space	No		Would offset against loss of Council revenue in metered spaces
Impact of parking spaces on urban amenity	No		Could be equal to the impacts of VKT on urban realm

4.1.2 Mobility value

Reducing motor vehicle ownership and use releases two types of mobility value:

- Reduced congestion resulting from fewer VKT per year
- Increased access to kerbside space resulting from fewer cars parked.

Reduced congestion

A reduction in VKT will, by definition, mean that congestion on the road network is reduced. In addition, a reduction in VKT will also lead to a lower incidence of vehicle crashes. Values for the economic benefit related to congestion and road safety have been determined through research

and published in the Australian and New Zealand guidelines for transport system management. These values have been used in the economic model.

Private access to newly available kerbside space

In a suburban setting, such as Kensington, when a resident disposes of a car the benefit is usually taken by another resident who parks in the vacated space. The benefit may be taken by a number of residents who can find parking spaces more easily. Although it could be significant, this mobility value is very difficult to determine and is therefore not included in the economic model.

Public access to newly available kerbside space

Alternatively the newly available space could be used for additional lane space, left turn lanes or space for other road users to park (loading zones, taxis, public transport). These benefits are difficult to quantify (as they would be specific to each circumstance) and therefore they are not included in the economic model.

Summary

A summary of the mobility benefits included (and not included) in the economic model is provided in Table 3 below.

Table 3: Summary of Mobility Benefits

ITEM	INCLUDED IN MODEL	UNIT RATE	NOTES
VKT impact on congestion	Yes	$0.2188 / VKT avoided	Accounts for the congestion impact of each additional VKT by car
VKT impact on crashes	Yes	$0.0472 / VKT avoided	Accounts for the impact of each additional VKT by car on road safety
Value of additional mobility for other road users related to on-street parking	No		Would offset against loss of Council revenue in metered spaces

4.1.3 Public health value

Shifting trips away from motor vehicles and reducing motor vehicle use releases three types of public health value, specifically benefits from:

- Increased physical activity (walking and cycling)
- Reduced vehicle emissions (health impacts from air pollution and societal impact of greenhouse gas emissions)
- Reduced noise

Each car share user changes their travel behaviour in a range of different ways. 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. These benefits have been

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estimated in financial terms and published in *Walking, Riding and Public Transport, Department of Infrastructure and Transport Australian Government 2013*.

Lower VKT results directly in fewer emissions including gases that contribute to health conditions such as asthma and wider environmental problems (such as the greenhouse effect and acid rain). These impacts have been estimated in financial terms and published in *AustRoads Technical Report AP-T285-14: Updating Environmental Externalities Unit Values 2014*.

Summary

A summary of the public health value included (and not included) in the economic model is provided in Table 4 below.

Table 4: Summary of Public Health Benefits

ITEM	INCLUDED IN MODEL	UNIT RATE	NOTES
Health benefit of increased activity (walking & cycling)	Yes	$7.61 / hour walked $11.89 / hour cycled	Accounts for the benefits that accrue from the physical activity of walking and bicycle riding as well as the associated injury costs
Value of reduced emissions on public health	Yes	$0.0121	Whole community costs of health care (financial impact at the State & Commonwealth level)
Value of reduced emissions on environment	Yes	$0.0064	Whole community economic impact
Value of reduced noise	Yes	$0.0029	Average of whole community impact regardless of road type and proximity of residents

4.1.4 Economic multipliers

Reducing motor vehicle ownership and use releases two types of economic value:

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

People who use car share vehicles are known to reduce their car ownership. Some join the service after disposing of a vehicle – typically to avoid a substantial repair cost. Others retire a vehicle that they own after they have tested the car share service. This can take up to eighteen months. Others join the service and are able to postpose or avoid purchasing a vehicle.

Users of the service find that they can cut their household transport budget substantially. Their 'alternative transport costs' rise. As well as the car share service fees, they increase their spending on taxis, bicycles and public transport tickets. However these increased costs are more than offset by the elimination of motor vehicle costs including financing, maintenance, insurance,

registration or parking. The amounts will vary, but a household could find itself with a 'transport surplus' of five thousand dollars. (A more conservative amount is used in the model).

When a household does not have to store a car, they do not need to buy or own a car park. This cost can be substantial. Each car space in a multi-storey car park costs at least $30,000 to construct and spaces in new apartments can cost $50,000 to buy. The capital commitment and debt servicing that is avoided is another financial benefit that accrues to the share car user.

Research suggests that up to 80% of this 'surplus' is likely to be spent in the local economy. 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. In general, people with lower proportion of motor vehicle trips are less likely to drive to where they spend the money and more likely to shop locally. If the average marginal propensity to consume is 80%, then an economic multiplier of 5 can be expected. This however has not been included in the model.

Summary

A summary of the economic multipliers included (and not included) in the economic model is provided in Table 5 below.

Table 5: Summary of Economic Multiplier Benefits

ITEM	INCLUDED IN MODEL	UNIT RATE	NOTES
Financial saving for each household (annualised)	Yes	$966.60 / car avoided	Accounts for all on road costs including finance.
Financial saving from reducing VKT	Yes	$0.1618 / VKT avoided	Significantly lower than total car costs so as not to duplicate on-road costs
Opportunity cost of not owning/renting a car space	Yes	$3,312 / car avoided	Would offset against loss of council revenue in metered spaces

4.1.5 Summary of benefits accrued to each user

For the individual users the biggest benefit comes from not owning a car park or a car. Each car share supports twenty users. The estimate assumes that five of these users (25%) have been able to avoid buying a $50,000 off street car park as shown in Figure 15 below.

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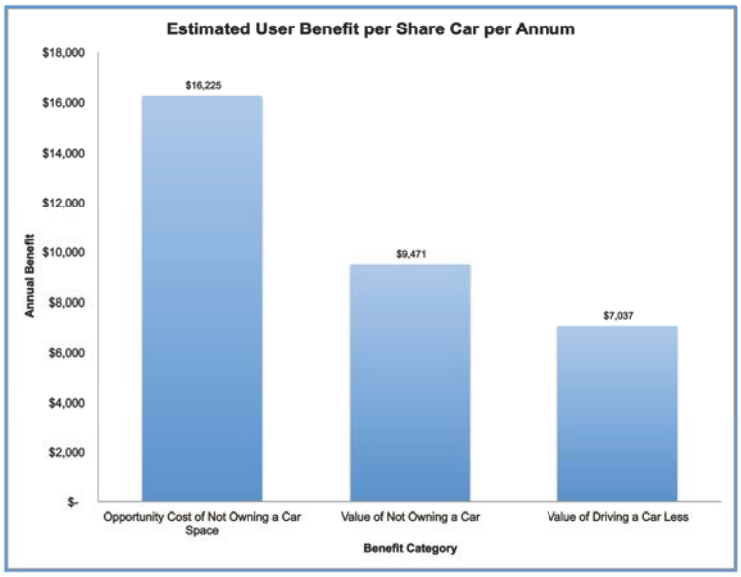
Figure 15: Estimated Annual User Benefit per Car

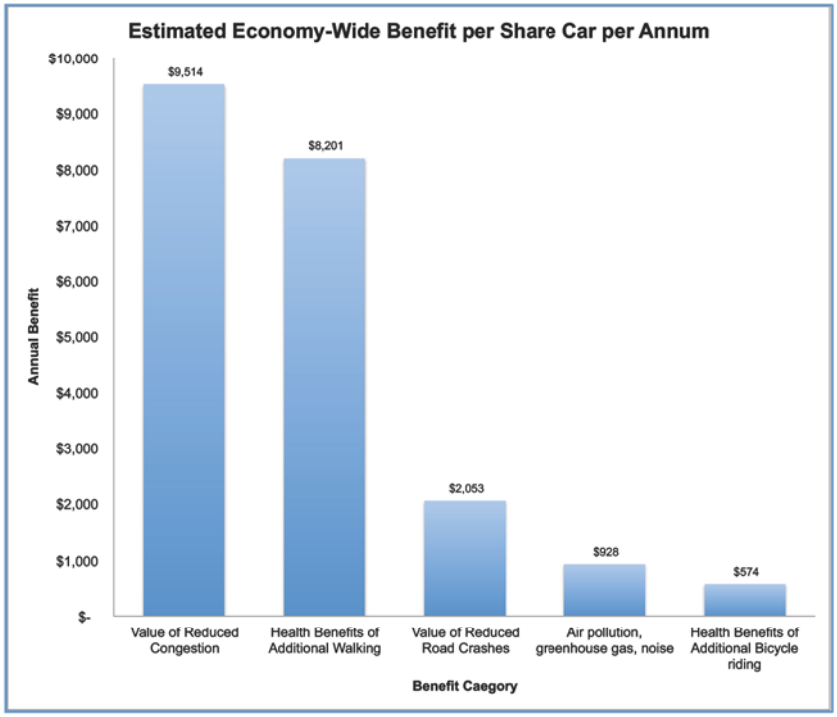


Source: PBA modelling

4.1.6 Summary of benefits accrued to the community

The analysis shows that the value of reduced congestion is the most significant social benefit as shown in Figure 16 below.

Figure 16: Estimated Annual Economy-Wide Benefit per Car share vehicle



Source: PBA modelling

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B.2. COSTS

Costs include the infrastructure (line marking and signage), maintenance (of the car space), internal staff time (administration) and forgone Council revenue (for on-street spaces displaced).

Costs have been estimated based on conservative assumption that all cars are located in existing on-street spaces and therefore displace existing users of that space. The cost estimate also assumes that the space currently provides income to the City of Melbourne, equivalent to the most productive CBD parking meters with high prices and occupancy.

Ongoing operational costs of the car share vehicles (both private costs and their impact on the community) are included in the model. This is achieved through calculation of the benefits based on the rate of change (in travel behaviour) per car share user. Because the benefits are based on the rate of change there is no need to account for the 2,000 annual VKT for each car share member in the costs.

4.1.7 Infrastructure

The infrastructure required to establish a car share parking space includes up to:

- Two signs on poles
- 15 metres of line marking around the space

These amounts are maximums that reduce if the car spaces are allocated in pairs (as they then share some of the infrastructure) and depending on the location and design of the car space (angle of parking could reduce the line marking required).

In some rare situations there may be other costs including construction of the car space however these will be a rare exception in circumstances where all other available space is allocated to more important uses.

These infrastructure costs have been estimated to amount to $500 per space.

4.1.8 Administration and Maintenance

Administration cost of the system from a Council perspective is likely to grow in proportion to the number of spaces required and has been estimated to currently require a junior staff member at about 0.5 effective full-time employment. This has been estimated to cost around $100 per space per annum.

Each car space requires maintenance. Typically line marking and signage will last for between 10 and 20 years and the pavement could last longer. Signs sometimes get vandalised or broken in crashes. The annualised maintenance cost of all these items has been estimated to be $400.

Therefore the total administration and maintenance cost is estimated to be $500 per space per annum.

4.1.9 Forgone Revenue

The highest value car spaces in the CBD are those that have a high hourly fee payable and high turnover (resulting from a 1 hour time limit and high demand throughout the day/night). It is estimated that these car spaces could generate around $15,000 in revenue per annum.

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Just over twenty car share spaces are currently located in the CBD, and those do not need to be in the 'premium' locations. Despite this we have assumed (for the purpose of a conservative model) that each car share space – wherever it is in the municipality – would reduce Council revenue by $15,000 per annum.

Summary

A summary of the costs included (and not included) in the economic model is provided in Table 5 below.

Table 6: Summary of Costs

ITEM	INCLUDED IN MODEL	UNIT RATE	NOTES
Infrastructure	Yes	$500 / car space	Includes signage & linemarking
Administration & Maintenance	Yes	$500 p.a. / car space	Includes 0.5 EFT staff & maintenance of pavement & signs
Forgone Revenue	Yes	$15,000 p.a. / car space	Highest possible rate. CBD space revenue is typically less & could be zero in non-CBD locations

B.3. BENEFIT COST ANALYSIS

The benefit cost ratio of the City of Melbourne's existing car share service management has been calculated based on the unit rates above and the assumptions listed below.

4.1.10 Assumptions

Members per car share vehicle

Data from car share service providers shows that on average each car supports around twenty members.

Ownership

Research shows that for every car share deployed there are ten cars avoided. Four of these ten are existing vehicles that new car share users decide to sell (and not replace). Six of these ten cars avoided are cars that would have otherwise been purchased in future by existing residents (such as those who do not need a second or third car as their children grow up) or new residents (particularly those attracted to the area for reasons of accessibility).

Vehicle Kilometres Travelled (VKT)

Avoided VKT is a key measure used to estimate social benefits for mobility and public health.

Motoring organisations such as the RACV base their estimates on an annual 'average' VKT of 15,000 km. This has been rounded up from ABS data.[19] Data from the Victorian Integrated

Survey or Travel and Activity (VISTA) suggests that a car based in the City of Melbourne is only driven for 4,000km a year.[20] Data from the service providers suggest that each car share user drives an average of 2,000km each year.[21]

The modelling of benefits and costs uses the conservative figure of a 2,000km reduction for every car share user in the City of Melbourne.[22]

Physical activity

The public health benefit estimates are based on increased physical activity. This value is generated when travel that otherwise would occur by car is now made by walk, cycle or transit trip. The estimate used self-reported mode use data provided by car share subscribers. This data suggests that 15% of trips are shifted away from the car, half to transit and half to a combination of walking and cycling.

4.1.11 Limitations

The estimate is sufficiently robust to inform the policy but has some limitations, including:

- Opportunity cost arising from lack of activity along the façade of the building
- Opportunity cost arising from lack of activity in the building
- Self reporting bias
- Conservative estimates

These are discussed below.

Opportunity cost arising from lack of activity along the façade of the building

There appears to be an absence of measures on the land use side. Their absence is unfortunate as the importance of these spatial values is identified in many Council strategies and policies. For example, there appears to be no readily available measure that can be applied to the assessment of a street that, because the buildings are constructed with ground level car parks, is 'lacking in activity or natural surveillance'. The impact of a parking podium on a street in Southbank is illustrated in Figure 17 below.

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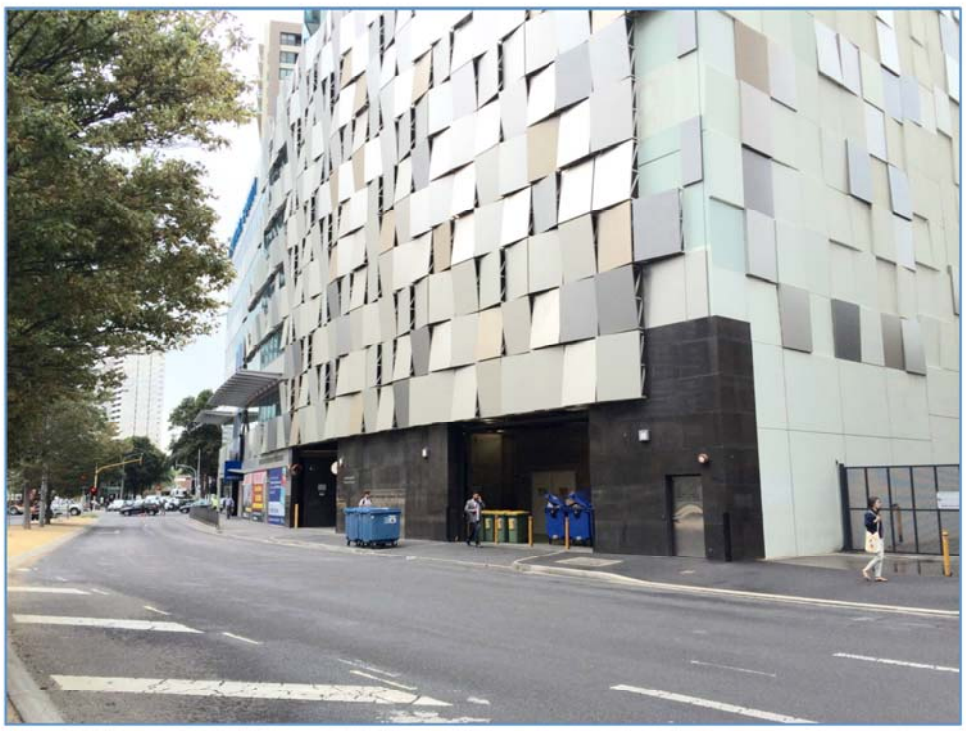
Figure 17: Parking podiums compromise street activity and natural surveillance



Opportunity cost arising from lack of activity in the building

In addition, there appears to be no readily available measure of the opportunity cost to various uses of space inside a building. It is obvious that an apartment building with, for example 20 unused or unsold car parks has fallen short of the best use of land and materials. It would be possible to estimate that these 20 car spaces would, if they had been constructed as 10 apartments, have had a certain value.

In another situation, car spaces on the ground floor have a value (financial and economic) but this value (particularly the impact on the surrounding economy) would be increased if the floor space was used for retail uses. Ground floor parking spaces are sometimes replaced with higher order users such as retail as shown in Figure 18 below.

Figure 18: Retail is a higher value use than ground floor parking

Self reporting

Some of the estimates rely on self-reported data. For example the shift in mode that is brought about by car share use is based on information from users. Their self-reported data has been found to be consistent with results from similar surveys in Europe and North America.

In Australia the various service providers collect this data using inconsistent methods. It will be important in the future to establish consistent and robust methods for these measures.

Use of conservative estimates

To avoid optimism bias the costs have been exaggerated and the benefits minimised.

The cost per car share deployed has been based on the average annual revenue for on-street meters in the CBD (which assumes there is no parking meter revenue from any spaces outside the CBD). This is conservative in two ways, firstly the revenue generated by a metered space is over-estimated, secondly is has been assumed that all car share spaces would displace a metered space (which in reality only happens in less than 20% of the cases).

The annual value of the car that is avoided or sold is set below $1,000 on the assumption that people are not selling valuable cars when they join a car share service. This value includes capital value, insurance and registration.

The estimate assumes that only a proportion of users have been able to forgo the ownership of a car park. The value was based on the cost of purchasing a car space at market rates and paying for it with a typical mortgage.

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4.1.12 Outcomes

The benefit cost analysis has estimated total benefits to users and the community and costs to the City of Melbourne.

For each car deployed the cost to the City of Melbourne has been estimated to be $16,000 and the net community benefit is estimated to be $55,000 for a net benefit of $38,000. The Benefit-Cost Ratio is estimated to be at least $3.42 for every $1 the City of Melbourne spends on car share services.

Conservatively the 240 car share vehicles in 2014:

- Provided a benefit of $13m
- Required a cost of $3.8m
- Delivered a net economic benefit of $9 million.

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Appendix C: The Value Estimate in Detail

Pillar	Rate per Member (Refer Table A)	Rate per Car Share (Refer Table A)	Unit Rate	Unit Value (2013 $) (CPI Adjusted)	Benefit per Member	Benefit per Share Car	Existing Fleet (240 vehicles)	Future Fleet 2021 (2000 vehicles)	Change	Source Table
BENEFITS										
Mobility										
Non-User Benefits										
Value of Reduced Congestion	2,219	43,492	VKT avoided	$ 0.2188	$ 486	$ 9,514	$ 2,283,381	$ 19,028,171	$ 16,744,790	B, E
Value of Reduced Road Crashes	2,219	43,492	VKT avoided	$ 0.0472	$ 105	$ 2,053	$ 492,766	$ 4,106,380	$ 3,613,614	B, E
Public Health										
User Benefits										
Health Benefits of Mode Shift										
- Health Benefits of Additional Walking	55	1,078	Extra Hour Walked	$ 7.61	$ 418	$ 8,201	$ 1,968,186	$ 16,401,550	$ 14,433,364	B, C, D
- Health Benefits of Additional Cycling	2	48	Extra Hour Cycled	$ 11.89	$ 29	$ 574	$ 137,809	$ 1,148,408	$ 1,010,599	B, C, D
Non-User Benefits										
Reduced air pollution	2,219	43,492	VKT avoided	$ 0.0121	$ 27	$ 525	$ 125,884	$ 1,048,030	$ 923,146	B, E
Reduced greenhouse gases	2,219	43,492	VKT avoided	$ 0.0064	$ 14	$ 278	$ 66,699	$ 555,829	$ 489,130	B, E
Reduced Noise	2,219	43,492	VKT avoided	$ 0.0029	$ 6	$ 125	$ 30,062	$ 250,515	$ 220,453	B, E
Economic										
User Benefits										
Value of Not Owning a Car	0.50	9.80	Car avoided	$ 966.60	$ 483	$ 9,471	$ 2,272,959	$ 18,941,325	$ 16,668,366	B
Value of Driving a Car Less	2,219	43,492	VKT avoided	$ 0.1618	$ 359	$ 7,037	$ 1,638,886	$ 14,074,047	$ 12,385,161	B, E
Opportunity Cost of Not Owning a Car Space	0.25	4.90	Car avoided	$ 3,312.00	$ 828	$ 16,225	$ 3,894,084	$ 32,450,700	$ 28,556,616	B
Spatial										
Non-User Benefits										
Reduced Impact on Soil / Water, Biodiversity, Nature / Landscape, Urban Barriers	2,219	43,492	VKT avoided	$ 0.0113	$ 25	$ 491	$ 117,846	$ 982,052	$ 864,206	B, E
Total User Benefits					$ 2,118	$ 41,508	$ 9,961,923	$ 83,016,029	$ 73,054,105	
Total Non-User Benefits					$ 663	$ 12,986	$ 3,116,637	$ 25,971,976	$ 22,855,339	
Total Benefits					$ 2,781	$ 54,494	$ 13,078,561	$ 108,988,005	$ 95,909,444	
COSTS										
Economic										
Non-User Benefits										
Foregone Council Parking Revenue	0.05	1	On-Street Car Share Space	$ 15,392.92	$ 786	$ 15,393	$ 3,694,300	$ 30,785,830	$ 27,091,531	B
Council administration, signage and linemarking costs per On-Street space	0.05	1	On-Street Car Share Space	$ 500.00	$ 26	$ 500	$ 120,000	$ 1,000,000	$ 880,000	B
Total User Costs					$ -	$ -	$ -	$ -	$ -	
Total Non-User Costs					$ 811	$ 15,893	$ 3,814,300	$ 31,785,830	$ 27,971,531	
Total Costs					$ 811	$ 15,893	$ 3,814,300	$ 31,785,830	$ 27,971,531	
BCR										
Total Benefits					$ 2,781	$ 54,494	$ 13,078,561	$ 108,988,005	$ 95,909,444	
Total Costs					$ 811	$ 15,893	$ 3,814,300	$ 31,785,830	$ 27,971,531	
Net Benefit					$ 1,970	$ 38,601	$ 9,264,261	$ 77,202,175	$ 67,937,914	
Benefit / Cost Ratio	3.43									

Sample Interpretation of the 'Value of Reduced Congestion' for residents of the City of Melbourne:

The value is estimated at $0.22 per VKT avoided (in 2013 $).

It is estimated that a Car Share has a VKT 2,219km per annum lower than an average non Car Share Member.

As each Share Car supports 19.6 members, each Share Car reduces the VKT 43,492km per annum.

In economic terms, this translates to a reduced congestion cost of $486 per member (2,219km x $0.22 per km). This is the equivalent of $9,514 per Share Car.

The existing 240 vehicle fleet provides a congestion benefit of about $2.26 million.

A future 2,000 vehicle car share fleet will provide a benefit of $19.03 million, an increase of $16.74 million.

Refer to Source Tables B & E for supporting references.

Fleet Size	Existing Fleet 240	Future Fleet 2000
Total Benefit	$ 13,078,561	$ 108,988,005
Total Cost	$ 3,814,300	$ 31,785,830
Net Benefit	$ 9,264,261	$ 77,202,175
Benefit Cost Ratio	3.43	

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Table A: Members per Car in the City of Melbourne

	A: Members per Car in CofM	Cars	Members	Rate	Note
	GoGet	113	1677	14.8	33 of these are off-street
	FlexiCar	87	2097	24.1	16 of these are off-street
	GreenShareCar	40	929	23.2	
	Total	*240*	*4703*	*19.6*	

Sources:
GoGet 2014, *Carshare Melbourne City Council Report Tables as at June 2014.*
Flexicar 2014, *Flexicar to the City of Melbourne Six Monthly Report covering July to December 2013.*
GreenCar share 2014, *GreenCar share Reporting Q1 & Q2 2014.*

Table B: Rates

B: Assumptions	Unit Rate (adjusted 2013 $)	Unit Rate	CPI Adjustment	Year of Unit Rate	Unit	Note / Reference
Reduced Car Ownership: Members that do not replace their car	0.12	0.12			Cars avoided per Member	1
Reduced Car Ownership: Members that are able to sell their car	0.12	0.12			Cars avoided per Member	1
Reduced Car Ownership: Members that use carshare as a backup	0.17	0.17			Cars avoided per Member	2
Reduced Car Ownership: Members that never buy a car	0.09	0.09			Cars avoided per Member	3
Reduced car ownership cost	$ 966.60	$ 775.00	24.7%	2005	Car avoided	4
Reduced air pollution	$ 0.0121	$ 0.0121	0%	2013	VKT avoided	5
Reduced greenhouse gases	$ 0.0064	$ 0.0064	0%	2013	VKT avoided	5
Reduced Noise	$ 0.0029	$ 0.0029	0%	2013	VKT avoided	5
Reduced Impact on Soil / Water, Biodiversity, Nature / Landscape, Urban Barriers	$ 0.0113	$ 0.0113	0%	2013	VKT avoided	5
Congestion relief	$ 0.2188	$ 0.2070	5.7%	2011	VKT avoided	6
Road Safety benefit	$ 0.0472	$ 0.0400	18.0%	2007	VKT avoided	7
Reduced car usage cost	$ 0.1618	$ 0.1618	0%	2013	VKT avoided	8
Net Health benefit of additional walking (assumes 5km/h)	$ 7.61	$ 7.20	5.7%	2011	Extra Hour Walked	9
Net Health benefit of additional cycling (assumes 15km/h)	$ 11.89	$ 11.25	5.7%	2011	Extra Hour Cycled	9
Opportunity Cost of Owning Car Space	$ 3,312.00	$ 3,312.00	0%	2013	Car avoided	10
Foregone Council Parking Revenue	$ 15,392.92	$ 15,392.92	0%	2013	On-Street Car Park Used for Car Share	11
Cost of Signage and Linemarking to designate a Share Car Bay	$ 500.00	$ 500.00	0%	2013	On-Street Car Park Used for Car Share	12

Note / Reference

1. Assume 50% of balance of respondents that are not "use as backup" or "never buy". Rule of One Half. GoGet, *2013 Carshare Member Survey - City of Melbourne.* 24.35%.
2. Rule of One Half. GoGet, *2013 Carshare Member Survey - City of Melbourne.* 33.8%
3. Rule of One Half. GoGet, *2013 Carshare Member Survey - City of Melbourne.* 17.5%
4. Australian Transport Council 2004, *National Guidelines for Transport System Management in Australia: Volume 4 Urban Transport*, Australian Transport Council, p 56.
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.
9. Department of Infrastructure & Transport 2013, *Walking, Riding and Access to Public Transport: Supporting Active Transit in Australian Communities*, Commonwealth of Australia.
9. Department of Transport 2010, *Victorian Integrated Survey of Transport & Activity (VISTA) 2009-2010*, Victorian Government.
9. GHD 2010, *City of Melbourne Car Sharing Research, Appendix G: Car Sharing Members Survey.*
10. Annual Repayment of a 30year CBA Home Loan equal to the value of an average Melbourne Off-Street Car Parking Space ($50,100).
10. Assumes 50% of Avoided Cars would have had an off-street space. findacarpark 2014, *Park it and pay*, Melbourne's average car park sale price of $50,100.
10. Commonwealth Bank of Australia, Home Loan Calculator, Loan = $50,100, Comparison Rate = 5.2%, Annual Repayments of Standard Variable Rate over 30 years.
11. GHD 2009, *City of Melbourne Car Sharing Research*, Table 2. City of Melbourne 2014, *Annual Plan and Budget 2014-2015*, p71.
12. Assumption.

Table C: Mode Shift Due to Car Share

Mode Shift due to Car Share	Before Car Share	After Car Share	Change
Bus	5.3%	11.2%	109%
Train	10.6%	11.4%	7%
Tram	12.1%	12.8%	6%
Walking	9.8%	13.7%	41%
Cycling	20.8%	24.2%	16%
Motorbike / Scooter	18.7%	17.4%	-7%
Car (as Driver)	21.2%	9.2%	-56%
Car (as Passenger)	1.5%	0.0%	-100%
Walking and Cycling	30.6%	37.9%	7%
Public Transport	28.0%	35.4%	7%
Car and Motorbike	41.4%	26.6%	-15%

Note:
'Primary Mode' only however respondents could nominate more than one 'Primary Mode' and so Mode Share adjusted pro-rata to total 100%.

Source:
GHD 2010, *City of Melbourne Car Sharing Research,* Appendix G: Car Sharing Members Survey.

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Table D: Trip Rate Changes

Trip Rates Change	Before Car Share	After Car Share	Change
Trip Rates per person per day			
Bus	0.02	0.03	0.02
Train	0.09	0.10	0.01
Tram	0.45	0.48	0.03
Walking	1.61	2.26	0.65
Cycling	0.12	0.14	0.02
Other (incl Motorbike / Scooter & Taxi)	0.06	0.05	- 0.00
Car (as Driver)	1.03	0.45	- 0.58
Car (as Passenger)	0.26	-	- 0.26
Walk Minutes per Trip			
Bus	13.67		
Train	19.06		
Tram	13.31		
Walking	12.82		
Cycling	-		
Other (incl Motorbike / Scooter & Taxi)	-		
Car (as Driver)	0.05		
Car (as Passenger)	0.35		
Cycle Minutes per Trip			
Cycling	19.88		
Walking Minutes Increase per person per day due to Mode Shift			
Bus		0.25	
Train		0.13	
Tram		0.38	
Walking		8.39	
Cycling		-	
Other (incl Motorbike / Scooter & Taxi)		-	
Car (as Driver)		- 0.03	
Car (as Passenger)		- 0.09	
Total		9.04	
Cycling Minutes Increase per person per day due to Mode Shift		0.40	
Additional Hours per Annum per Person	365.25 days		
Walking Hours		55.00	
Cycling Hours		2.46	

Note:
Vista for 'Before'. After based on change per mode from Table C.

Source:
Department of Transport 2010, *Victorian Integrated Survey of Transport & Activity (VISTA)*, 2009-2010.

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Table E: VKT Change due to Car Share

Change in VKT per Annum due to Car Share	VKT	% of Members	Per Member
Method 1: GHD City of Melbourne User Survey (n = 335)			
VKT before Car Share	< 1000	35.6%	178
	1000 to 2000	14.7%	221
	2000 to 3000	8.0%	200
	3000 to 4000	7.4%	259
	4000 to 6000	10.7%	535
	6000 to 8000	5.8%	406
	8000 to 12000	9.5%	950
	12000 to 15000	2.8%	378
	> 15000	5.5%	963
	Total		*4,089*
VKT After Car Share	< 1000	34.7%	174
	1000 to 2000	28.8%	432
	2000 to 4000	15.3%	459
	4000 to 6000	9.5%	475
	6000 to 8000	4.0%	280
	8000 to 12000	4.9%	490
	12000 to 15000	0.9%	122
	> 15000	1.8%	315
	Total		*2,746*
VKT Avoided			1,343
Method 2: Vista and Car Share Operators			
VKT of Typical Resident of City of Melbourne	3,848		3,848
VKT of Typical Car Share Member (only FlexiCar data available)			
Per Car Share Vehicle	18,125		
Members per Vehicle	24.1		
Per FlexiCar Member	752		752
VKT Avoided		-	3,096
VKT Before (average of two methods)			3,968
VKT After (average of two methods)			1,749
Estimated VKT Avoided per Annum			2,219

Sources:
For Method 1: GHD 2010, *City of Melbourne Car Sharing Research*, Appendix G: Car Sharing Members Survey.
For Method 2: Department of Transport 2010, *Victorian Integrated Survey of Transport & Activity (VISTA), 2009-2010* and Flexicar 2014, *Flexicar to the City of Melbourne Six Monthly Report covering July to December 2013*.

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Appendix D: The Review Process

The following documents were used in the review process:

- Relevant studies, reports and best practice on car share services in Australia, Europe and North America
- Usage data and impact on car ownership and vehicle kilometres travelled in Melbourne and other cities
- Assessment of existing Car Share operations in the City of Melbourne since 2005.

International

The Impact of Carsharing on Household Vehicle Ownership Elliot Martin And Susan Shaheen *Access* Number 38 Spring 2011

Other publications from http://tsrc.berkeley.edu/carsharing :

the Transportation Sustainability Research Centre University of California Berkeley (Susan Shaheen, Ph.D. Adjunct Professor, Civil and Environmental Engineering, Co-Director, TSRC Director, Innovative Mobility Research) including:

Carsharing in North America:A Ten-Year Retrospective Transportation Research Record: Journal of the Transportation Research Board, 2110: 35–44. Susan Shaheen, Adam Cohen, and Melissa Chung. 2009.

Impact of Carsharing on Household Vehicle Holdings: Results from a North American Shared-Use Vehicle Survey Elliot Martin, Susan Shaheen, and Jeffrey Lidicker. 2010.

Carsharing's Impact On Household Vehicle Holdings: Results From A North American Shared-Use Vehicle Survey Elliot Martin, PhD, Susan A. Shaheen, PhD, Jeffrey Lidicker, M.A., M.S March 15, 2010

Me, my car, my life ...in the ultraconnected age kpmg.com/automotive 2014

Summary reports: England and Wales, London, Scotland Carplus Annual Survey of Car Clubs 2013/14

Car-sharing in London – Vision 2020 A Frost & Sullivan White Paper (Funded by Zipcar)

The State of European Car-Sharing Final Report 2009 European Union

Car-Sharing: Where and How It Succeeds Transport Research Board Washington DC 2005

Interview: Dan Curtin Manager ZipCar Boston and London.

National

Benefit-Cost Analysis of Car Share within the City of Sydney Final Report The Council of City of Sydney June 2012 SGS Economics

Car Sharing Research Final Report September 2010 City of Melbourne GHD

Car share Analysis City of Melbourne January 2015 Movendo

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Car share policies and web page communications

The following local government authorities were reviewed with respect to car share information and local policies:

- City of Darebin
- City of Melbourne
- City of Maribyrnong
- City of Moonee Valley
- City of Moreland
- City of Port Phillip
- City of Stonnington
- City of Sydney
- City of Yarra

Car share reports

Flexicar, Go Get and GreenShareCar reports to City of Melbourne (and other municipalities) 2010 – 2014

Other references

The cost benefit assessment in Part One is fully referenced. Main references include:

National Guidelines for Transport System Management in Australia: Volume 4 Urban Transport, Australian Transport Council, p 56.Australian Transport Council 2004,

Updating Environmental Externalities Unit Values, Austroads, Table 6.1 Austroads 2014, Austroads Technical Report AP-T285-14:

Walking, Riding and Access to Public Transport: Supporting Active Transit in Australian Communities Department of Infrastructure & Transport 2013, Commonwealth of Australia.

Crash Cost Rate for Urban Roads ARRB 2007, Road Safety Risk Reporter Issue 7

Vehicle Operating Costs (Light Cars) RACV 2014

Victorian Integrated Survey of Transport & Activity (VISTA) 2009-2010 Department of Transport 2010 Victorian Government.

Policy context

The following policies were reviewed:

- The Municipal Strategic Statement
- The Transport Strategy Planning for Future Growth 2012
- CBD and Docklands Parking Plan 2008-2013
- Zero Net Emissions by 2020 update 2014
- Road Safety Plan 2013 – 2017
- Melbourne City Council: Council Plan 2013 – 2017
- Melbourne Planning Scheme Amendment C133 - Amendment for Carlton, Southbank and parts of North Melbourne, West Melbourne and East Melbourne:

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  - Zero on-site car parking spaces
  - Limit of one car parking space per dwelling for developments over four storeys
  - Allows for reductions in required car parking for developments under four storeys
- Arden-Macaulay Structure Plan 2012
- City North Structure Plan 2012
- Southbank Structure Plan 2010
- West Melbourne Structure Plan 2005

Engagement with stakeholders

The following were invited to attend a consultation session:

- Carlton Residents Association Inc.
- Hardware Precinct Residents and Tenants Association
- Kensington Public Tenants Association Inc.
- Kensington Association Inc.
- Melbourne South Yarra Residents' Group Inc.
- Flemington Association
- East Melbourne Group Inc.
- EastEnders Inc.
- Docklands Community Association
- Residents 3000 Inc.
- Parkville Gardens Residents Association Inc
- Parkville Association Inc.
- Carlton Housing Estate Residents Services (CHERS)
- North & West Melbourne Association
- Southbank Residents Group Inc.
- Coalition of Residents and Business Associates
- Yarra River Business Association Inc.
- North-West Melbourne Precinct Association
- City Precinct Inc. (city centre and laneways)
- Collins Street Precinct Group
- Docklands Chamber of Commerce
- Greek Precinct Association (GPA)
- Carlton Association Precinct Inc.
- Chinatown Precinct Association
- Melbourne Business Network

Car share users – 3 attended

Representatives of Melbourne Body Corporate Management and Melbourne Inner City Management were invited.

Representatives from W Property Group and Lend Lease attended.

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A consultation session was held for local government staff with relevant responsibilities with attendance from:

- City of Melbourne
- City of Port Phillip
- City of Port Phillip
- City of Yarra
- City of Moreland
- City of Moreland
- City of Maribyrnong
- City of Stonnington

Telephone interviews were conducted with staff at:

- The City of Darebin
- The City of Moonee Valley

Staff from the City of Melbourne attended the consultation sessions including representatives from:

- Engineering Services
- Strategy and Planning
- City Research
- Development Planning

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Endnotes

[1] World Cities Summit Mayors Forum 1 June 2014

[2] Car share Analysis 21 January 2015 Movendo (Data range: January to June 2014)

[3] The total benefits are estimated at $13m, the costs at $3.8m for a benefit cost ratio of 3.4 to 1.

[4] SMART – Specific, Measurable, Achievable, Relevant, Time based

[5] Fixed-base services are those that rely on a car that is "based" at a fixed location. When the car is away from that fixed location the cost of parking or storing the car falls to the service operator or user.

[6] *Movendo* 2015

[7] Replacement typically occurs when the owner decides that the cost is too high for the amount that they use the vehicle. Replacement can also be triggered when the owner wants to avoid paying for a major repair.

[8] A number of Cities polices support reduced motor vehicle ownership in particular:

- The land use policies of the City such as Amendment C133 to the planning scheme that defines a zone in which the construction of residences with 'zero on-site car parking spaces' is permitted. The Amendment also places a discretionary limit of one car parking space per dwelling for developments over four storeys.'
- The parking permit policies of the City which do not allow Residential Parking Permits to be issued to properties that are rated as commercial, have a certificate of occupancy dated before a certain date* or have been reconstructed to increase residential density or as purpose built student accommodation.

*(25 March 2010 (areas 3B, 7, 12, 15A, 16, 18) or 25 October 2011 (area 8))

[9] 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 amendmentto the planning scheme toset maximum car parkingrates 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

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[10] CBD and Docklands Parking Plan 2008 – 2013

Table 9 – decline of on-street car parking spaces – central city

Year	On–street total spaces	Off-street total spaces	% total of on-street
1964	9,500	22,500	42
1977	9,300	35,300	26
1984	8,000	43,500	20
2007	4,200	64,000	7

[11] In the City of Yarra

[12] Vehicle occupancy is within the range of 1.16 (AM peak) and 1.22 (Off peak). VicRoads Traffic Monitor 2012-2013

[13] Car share Analysis 21 January 2015 *Movendo*

[14] In the CBD approximately 4,192 short-stay spaces are provided on-street. 3,077 are metered bays with the other spaces used as disabled parking, loading zones, bus parking, taxi zones and short-term pick up and set down areas.

CBD and DOCKLANDS PARKING PLAN 2008-2013

[15] 'Our definition of public transport includes train, tram, bus, taxi,car share and bike share and, for regional trips, air travel – all cases of the use of a shared vehicle.'
Transport Strategy 2012

[16] Municipal Strategic Statement Clause 21.09 – 5 Private Motor Transport

[17] The Transport Strategy *Planning for Future Growth* 2012

94. Priority Action: Work with car share operators in allocating City of Melbourne operated parking spaces to car sharing in the municipality's existing and emerging high density mixed use areas.

Develop a car share policy

In order to direct the Cityof Melbourne's support for car sharing, a specific policy will be developed to:

- Provide a clear process for allocating parking spaces
- Detail the City of Melbourne's communications activity to support the growth of car sharing
- Discuss and address revenue implications of allocating on-street space to car sharing
- Define the rules for operating a car share scheme in the municipality
- Recommend City of Melbourne projects to further embed car sharing in Melbourne, for example opportunities to amend the planning scheme to encourage off-street car share parking.

95. Priority Action: Review Council's car sharing policy to ensure it meets the objectives of this strategy.

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Encourage an innovative car share industry

New forms of car sharing are constantly evolving, including programs for which a cardoes not have to be parkedat a 'home pod' and can be used for one-way journeys. These may offer new mobility choices and further encourage sustainable transport choices.

96. Action: Monitor innovations in car sharing and update its car sharing policy where these would produce improvements.

[18] Redistribution of parking in nearby streets increased the net supply by one space.

[19] RACV's car owning and operating costs guide. The calculations are provided as a guide to the car operating costs of a vehicle over a five year, 75,000 km (15,000 km per year) period.

The major assumption behind the operating and ownership costs methodology is that motorists travel 15,000 km per year. This is slightly above the ABS Survey of Motor Vehicle Use (12 months ended 30 June 2012) which estimates that the average Victorian registered passenger car travels 13,200 km per year. An assumed distance of 15,000km per year has been maintained for the purpose of comparing with previous year's results.

The cost of ownership is calculated over a 5 year period.

The operating and ownership costs are only indicative of the costs associated with a vehicle driven in these exact conditions. No conclusion can be drawn about the vehicle operating costs outside of these ownership period and operating distance.

The 2014 operating and ownership cost calculations only apply to private buyers and the costs associated with vehicle ownership and operation have been specifically targeted to them.
As with previous years the ownership costs are estimated for the year 2014, and future predictions based on CPI are not included.

[20] Typical City of Melbourne resident VKT, VISTA 2009 – 2010.

The Victorian Integrated Survey of Travel and Activity (VISTA) an ongoing survey of travel and activity showed that a typical City of Melbourne resident travelled 3,850km by car.
The self reported results of a survey for the GHD report below supported this figure independently.
Each car travels about 10,000km

[21] Car share VKT:

- City of Melbourne: Car Sharing Research Final Report GHD September 2010 - self reported survey – 2,750km
- Flexicar 6 monthly report 2013 to City of Melbourne – odometer reading and member records – 18,000 VKT per car and 750 VKT per member.

[22] VKT From the: RACV's car owning and operating costs guide

The calculations are provided as a guide to the car operating costs of a vehicle over a five year, 75,000 km (15,000 km per year) period.

The major assumption behind the operating and ownership costs methodology is that motorists travel 15,000 km per year. This is slightly above the ABS Survey of Motor Vehicle Use (12 months ended 30 June 2012) which estimates that the average Victorian registered passenger car travels 13,200 km per year. An assumed distance of 15,000km per year has been maintained for the purpose of comparing with previous year's results.

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Typical City of Melbourne resident VKT

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Each car travels about 10,000km