The Economic Contribution of

e-scooters

to the Melbourne Economy

The First 12 Months

April 2023

AEAS Australian Economic Advocacy Solutions

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Executive Summary

AEAS was commissioned to analyse the economic and environmental contribution of Neuron Mobility's e-scooter fleet across the first year of operation in Melbourne. This AEAS report captures the direct, indirect and enabled economic and employment contribution that Neuron's e-scooters make to the Melbourne economy and community. This report seeks to analyse the economic impact of Neuron Mobility's shared micro mobility solutions and the extent to which it is contributing to the prosperity of Melbourne.

In the first 12 months 1,810,700 individual rider trips were taken by Neuron customers in Melbourne, covering a combined distance of over 3.45 million kms. The average trip length was 1.9 km and the monthly average trips was 150,900 and monthly kilometres travelled over 287,550. The prevailing trend is an increase across the period in both trips taken and kms travelled following the cessation of opening trial incentives.

Neuron Mobility's shared e-scooters are assessed by AEAS to contribute significantly to the Melbourne economy and provide considerable other benefits to the community. The expansion of micro-mobility services such as those provided by Neuron Mobility represents a positive impact on the City of Melbourne, City of Port Phillip and the Yarra City Councils and the continued consolidation of Melbourne as a city of international significance.

Neuron Mobility's most recent Melbourne Rider Survey identified that 65.0% of trips result in a purchase. Of these, 37.9% of riders made a purchase as part of their latest ride at a hospitality venue; 29.7% made a purchase at a department store, supermarket or other retail store; and 16.4% visited a gym, movie or event. The average spend for each rider trip was $65.97. At present 96.2% of users believe Neuron e-scooters have a somewhat positive, positive or extremely positive impact on Melbourne.

In the first twelve months of operation, Neuron Mobility is estimated to have contributed $135.74 million in direct, indirect and enabled economic activity towards Melbourne's economy. Through enabling affordable, rapid and easily accessible transport options for Melbourne tourists, residents and business community members, AEAS has determined that Neuron e-scooters have contributed 11 cents in every $100 in Melbourne's economic activity over this period. Furthermore, Neuron Mobility is estimated to have created and supported 800 Melbourne based jobs.

AEAS analysis indicates Neuron Mobility's estimated economic contribution towards Melbourne's economy will rise from $135.74 million in 2022-23 to $219.85 million by 2027-28.

Table: Total Economic Contribution of Neuron E-Scooters in Melbourne - $ millions

	First 12 Months
Direct	$8.49 million
Indirect	$7.80 million
Enabled	$119.45 million
Total	$135.74 million

Source: AEAS 2023

Neuron Mobility's created and supported employment will also rise, from 800 Melbourne based jobs in 2022-23 to 1,296 jobs by 2027-28.

Table: Total Employment Created by Neuron E-Scooters in Melbourne - persons

	As at February 2023
Direct	87
Indirect	30
Enabled	683
Total	800

Source: AEAS 2023

Melbourne's current and forecast population and economic growth represents an attractive and significant market for shared e-scooter operations. An efficient transport network is critical to sustaining economic success in modern economies such as Melbourne's.

Melbourne is experiencing deteriorating overall traffic network performance with growing economic and population growth only further exacerbating the resulting traffic congestion and time delays that are emerging. This is unquestionably leading to a substantial economic cost for the city.

Greater utilisation of shared micro-mobility solutions such as Neuron's will undoubtedly help ease this congestion. An estimated 869,135 vehicle trips or 1,656,282 vehicle kilometres in Melbourne were saved as a result of Neuron Mobility operations in the first twelve months.

As a result rider usage of Neuron's shared e-scooters offers a range of other tangible and quantifiable benefits to the Melbourne community.

These benefits include:

- An overall productivity estimate of $3.38 million for Melbourne users of Neuron's E-scooters each year as a result of reduced time travelling annually;
- The three councils would save an estimated $1.29 million each year and the Victorian Government would potentially save up to $7.08 million in road maintenance costs each year; and
- A reduction of 225.6 tonnes of CO_2 emissions from less cars travelling on Melbourne roads annually.

At present, Neuron's e-scooter usage is largely unconstrained based on user demand. Rider survey results indicate preferences for a larger operating area (51.4%) including Kew, Hawthorn, Prahan, Northcote, Brunswick, Williamstown and Brighton, more or larger parking areas (25.1%) and better availability of e-scooters (38.5%).

AEAS has modelled increases in economic and employment contribution under theoretical scenarios underpinned by improvement of Neuron Mobility's commercial arrangement and infrastructure delivered by City of Melbourne, City of Port Phillip and the Yarra City Councils. Based on consultation, this would allow for increased investment by Neuron Mobility in device numbers, locations and service area that would deliver an uplift in rider usage across Melbourne, and in turn increased economic and employment benefits.

AEAS believes it is feasible for a 20% annualised uplift in Melbourne rider usage to be possible based on 38.4% of Neuron riders citing unavailability of e-scooters when needed. A 20% uplift in riders would see:

- Neuron's economic contribution rises from $135.74 million in 2022-23 to $547.05 million in 2027-28 (a $411.31 million increase in economic activity).
- Neuron's employment contribution rises from 800 jobs in 2022-23 to 3,224 jobs in 2026-27 (an increase of 2,424 jobs).

Figure: Modelled Increase in Total Economic Contribution Neuron E-Scooters ($ millions)
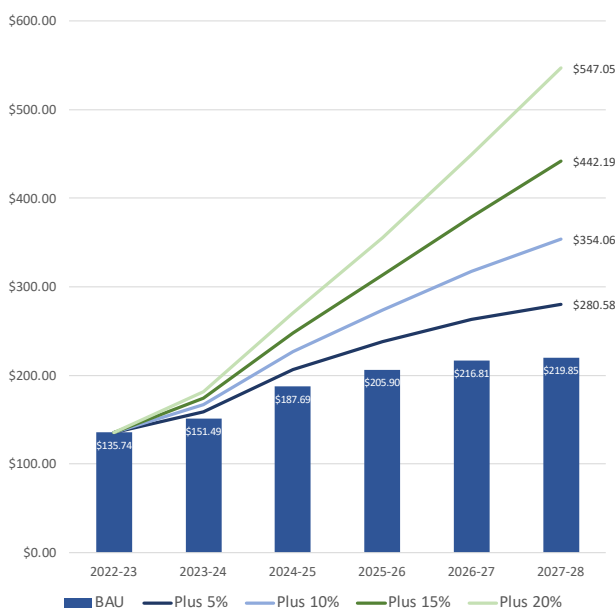
Figure: Modelled Increase in Total Created Employment by Neuron E-Scooters (persons)
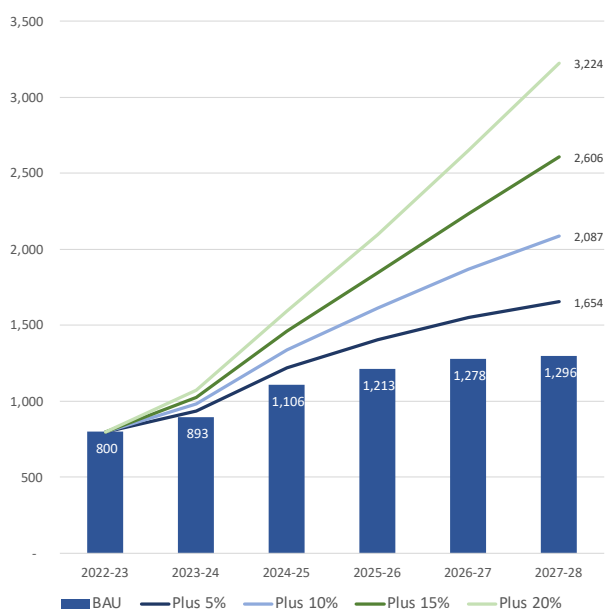
Source: AEAS 2023

AEAS economic modelling demonstrates that incentivising Neuron to increase supply of devices will result in significant upside over the coming five years. Such action is anticipated to provide a range of benefits including increased jobs, greater economic activity, reduced council costs and lower greenhouse gas emissions for greater Melbourne.

1.0   Introduction

Neuron Mobility's shared e-scooters contribute significantly to the Melbourne economy and provide proven environmental benefits. They offer an all-in-one transport solution that make Melbourne commutes more convenient, accessible and productive thereby reducing greenhouse gas emissions and contributing to the local economy.

AEAS was commissioned to analyse this economic and environmental contribution. The AEAS report captures the sizeable direct, indirect and enabled economic and employment contribution that Neuron's e-scooters made to the Melbourne economy and community over the first 12 months. The report seeks to demonstrate that Neuron Mobility shared micro mobility solutions are contributing substantially to the prosperity of Melbourne.

Decision makers are considered to be largely unaware of the significant contribution that Neuron's e-scooters make to the Melbourne economy due to an absence of accurate and timely estimates of its benefit. The scope of this report seeks to fill that void.

2.0   Scope of Report

2.1   Overview

The scope of this report provides an assessment of Neuron's contribution across a range of metrics to assist in establishing Neuron's economic and environmental importance. The report was developed in close consultation with Neuron Mobility and is set out in the below sections:

- Section 3.0: Provides a detailed overview of Neuron Mobility's operations in Melbourne including usage numbers, value to riders, usage reasons and broader benefits to the Melbourne community;
- Section 4.0: Provides a Socio and Economic overview including population, population characteristics, social infrastructure and social drivers, general economic summary, economic composition, employment by industry and a description of local businesses in Melbourne;
- Section 5.0: Provides an evaluation of economic impacts including direct and indirect impacts for Neuron Mobility's created employment and economic activity as measured by industry value add as well as estimates for enabled economic activity that Neuron Mobility supports through rider spend in the Melbourne economy;
- Section 6.0: Evaluates other benefits to the community including productivity benefits, environmental benefits and maintenance savings to Councils and the Victorian Government; and
- Section 7.0 : Provides modelling of economic and employment benefits of more favourable commercial terms offered by Councils and the Victorian Government.

2.2   Neuron Mobility Service Area

Neuron Mobility's service area includes:

- the City of Melbourne,
- City of Port Phillip; and
- Yarra City Council.

As a result AEAS's economic and environmental benefit assessment of Neuron Mobility's operations focuses on this area of Melbourne.

An economic and socio summary of the service area is provided in section 4.0.

"Just moved from NSW to VIC and scootering has had such a positive impact on my daily routine. I look forward to the end of my workday so I can hop on one and go exploring or run errands." Neuron Rider

Figure 1: Neuron Mobility's Melbourne Service Area
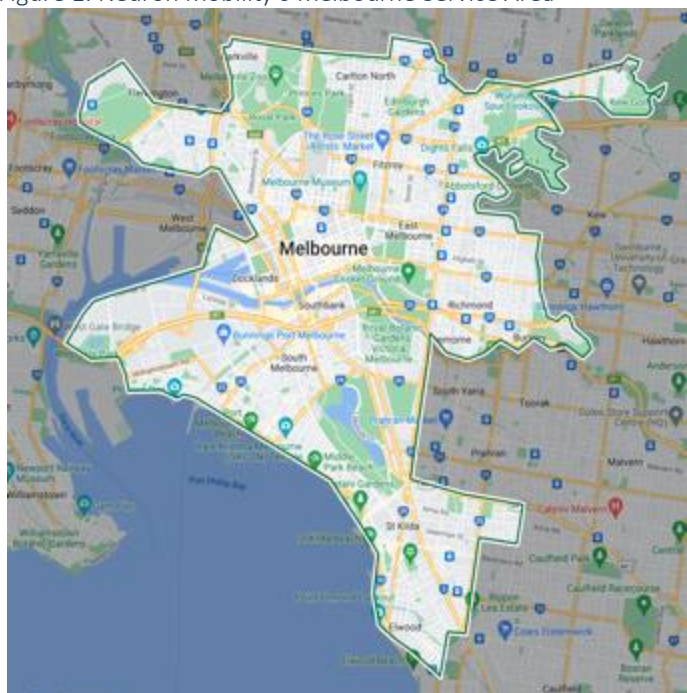
3.0   Neuron Mobility Focus on Melbourne

3.1   Neuron Mobility Overview

Neuron Mobility was founded in Singapore in 2016 and currently has operations in Australia, New Zealand, Canada and the UK. Neuron's distinctive orange e-scooters are designed in-house and manufactured specifically for renting and for safety.

Neuron Mobility generally seeks to partner with key cities to connect people and places in a safe, convenient and fun way. Neuron Mobility is focused on building close relationships with councils, and working hand-in-hand with them to make short trips as safe and efficient as possible. Neuron Mobility is a key and integral part of City of Melbourne's, City of Port Phillip's and the Yarra City Council's future and growth with Neuron establishing its presence in Victoria's capital city in early 2022. A heat map of the Neuron Mobility rider start locations (left figure) and rider end locations (right figure) is provided below.

Figure 2: Neuron Mobility rider start and end locations
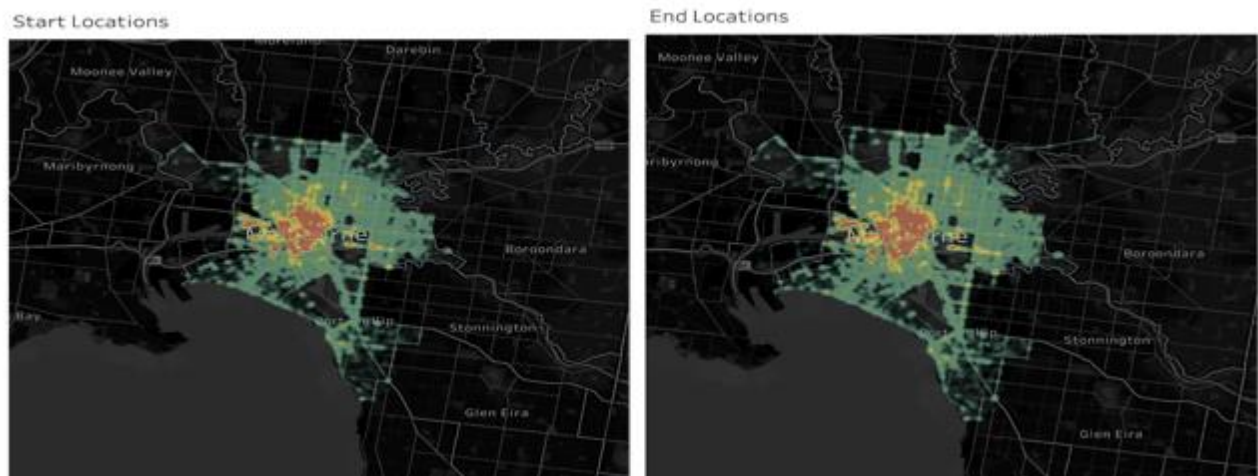
Source: Neuron Mobility

3.2   Neuron E-scooter Usage

In the first twelve months there were 1,810,700 individual rider trips taken by Neuron customers covering a combined distance of over 3.4 million kms. The average trip length was just 1.9 km and the monthly average trips were 150,890 and 287,550 kilometres travelled. The prevailing trend is an increase across the period in both trips taken and kms travelled following the cessation of opening trial incentives .

Figure 3: Neuron Mobility Shared E-Scooter Rider Trips and Kms travelled
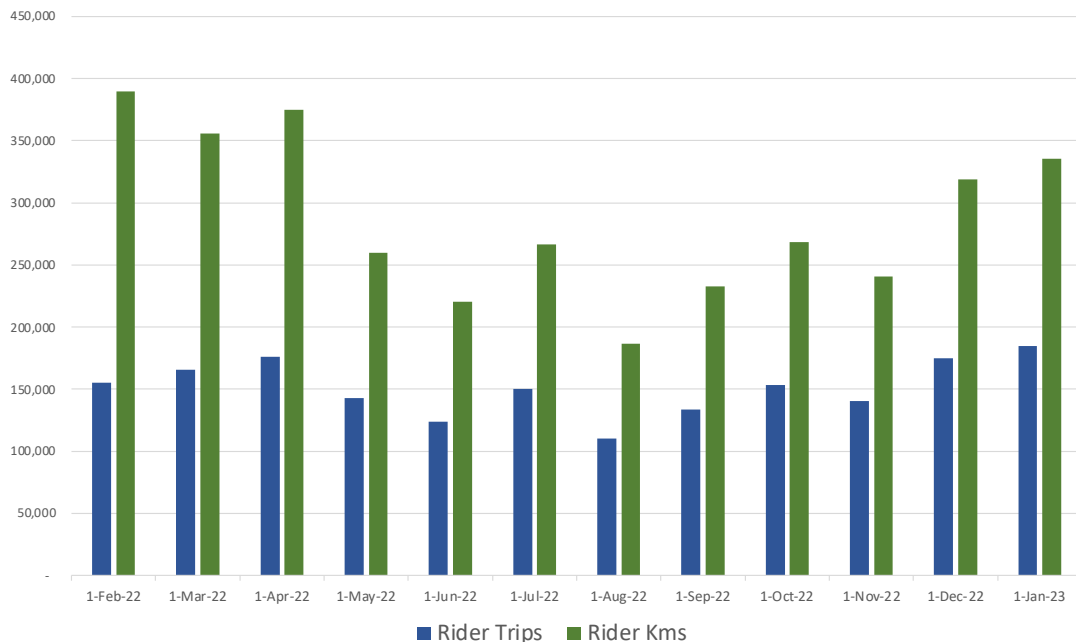
Source: Neuron Mobility

3.3 Neuron's Value to Riders

According to a recent survey of Neuron Mobility's Melbourne riders during November 2022, Neuron's e-scooter value, and in turn, increased patronage, has been driven by rider enjoyment (56.9% of riders), it being a faster way to get around and extended range in a given time (54.0%), and in being an easier way to explore the city (43.1%).

Figure 4: Neuron's Value to Riders
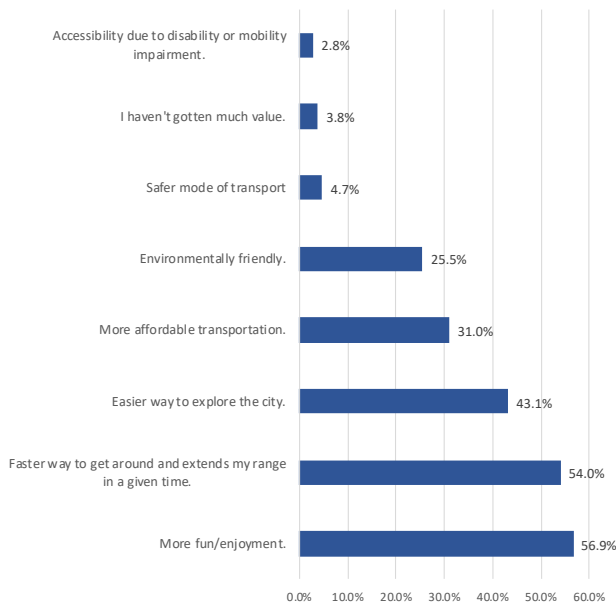
Figure 5: Reason for Neuron Rider Usage
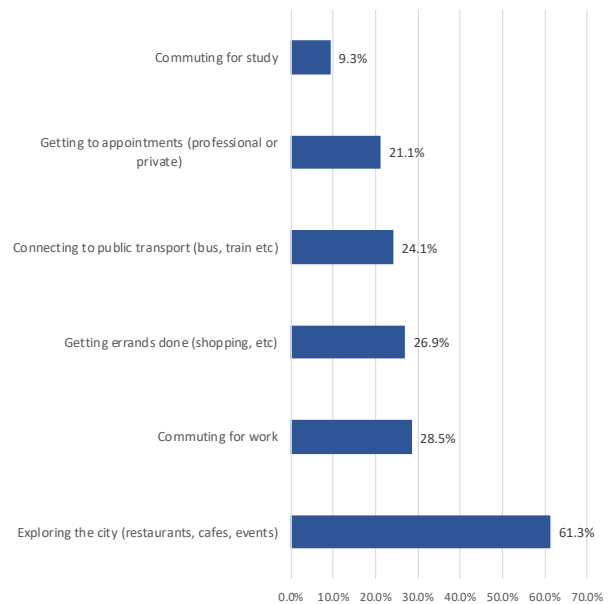
Source: Neuron Mobility Melbourne Rider Survey – November 2022

The Neuron Mobility Melbourne Rider Survey found that the primary reasons for using Neuron's e-scooters are exploring the city (61.3%), commuting for work or study (37.8%) and getting errands done including shopping (26.9%).

3.4 Neuron's Broader Benefits to the Community

The economic benefits of Neuron's shared e-scooters are considered be significant and include:

Increased sales and improved tourism	E-scooters encourage tourism in Melbourne and tourists are highly likely to ride shared e-scooter schemes to gain access to local retail stores, restaurants and entertainment venues. Overall, shared e-scooters help tourists travel around and discover local shops and destinations and in turn spend more.
Higher productivity	E-scooters provide significant time-saving benefits that improves productivity. E-scooters help cut down on travel time by allowing riders to bypass traffic and arrive at destinations faster. E-scooters for commuting help riders go through narrow or alternative routes, which also help cut time travelling. E-scooters directly addresses the issue of commuters spending hours on the road stuck in congestion resulting in loss in productivity for businesses and individuals. In addition riders don't have to waste time looking and paying for parking.
Affordable personal transport	E- scooters offer riders a more affordable transport alternative. People in the lower-income bracket use shared e-scooters because of their affordability. E-scooter users no longer need to pay for fuel costs. Shared e-scooter use for short distances is often cheaper than taking public transport facilities.
Access to opportunities	A key economic benefits of e-scooters is enabling riders to attend their current work and other job opportunities thereby adding to the economy.
Quick and Practical Ride	Commuting on a shared e-scooter allows riders to travel through the city quickly in a practical way. Many use it as a first and last-mile solution. This refers to the distance you take before or after riding public transportation, such as going to the nearest rail or bus station. . Riders can store e-scooters in appropriate parking spaces which also frees up council parking spaces
Avoided council costs	Utilisation of shared e-scooters takes vehicles of the surrounding road network that reduces council maintenance costs and reduces scale requirements for parking and public transport.

The environmental benefits of Neuron's shared e-scooters:

Greenhouse gas emission savings	E-scooters emit significantly lower carbon emissions and harmful gases than vehicles and other motorised vehicles. They help reduce air pollution, especially in highly density cities (eg Melbourne's urban infill). There are little to no direct emissions from e-scooters and related emissions are in their production.

4.0   Melbourne Socio and Economic Overview

4.1   Introduction

The City of Melbourne is the centre of Victoria's business, administrative, cultural and recreational activities. On average, over 850,000 people visit the city centre every day and each year Melbourne hosts over a million international visitors[1]. Adjacent city councils include the City of Port Phillip and the City of Yarra. Melbourne is projected to be the fastest-growing capital city from 2023–2024 and is set to become the nation's most populated city by 2030[2].

Table 1: Statistical Summary – City of Melbourne, City of Port Phillip and Yarra City Council - 2021

	City of Melbourne	City of Port Phillip	Yarra City Council
Estimated resident population (no.)	153 674	103 508	91 543
Working age population (aged 15-64 years) (%)	86.1	75.3	77.8
Aboriginal and Torres Strait Islander Peoples (no.)	772	514	513
Persons born overseas (no.)	81 818	33 549	25 774
Median total income ($)	47 429	64 663	66 659
Total number of businesses	41 418	21 047	15 838
Number of jobs	164 966	120 484	101 090
Land area (ha)	3 754.5	2 061.4	1 954.2

Source: ABS & AEAS 2023[3]

Key competitive advantages include:

- Melbourne is one of the most cosmopolitan and multicultural cities in the world with people speaking more than 260 different languages and dialects.
- Melbourne has outstanding arts, food and wine, Australia's best shopping, and diverse sporting and leisure opportunities. Melbourne is regarded as the nation's events and cultural capital.
- Melbourne is one of the world's most liveable cities and is ranked third in the Global Smart Cities Index and 39th in the world on the Global Start-ups Ecosystem Index.
- Melbourne is a leading capital city within the GMT+10 time zone. This positions Melbourne at the heart of a time zone region (two hours either side of GMT+10), that spans across Shanghai, Singapore, Hong Kong, the Philippines and large parts of Southeast Asia.
- Melbourne is Australia's freight and logistics hub and has several multi-modal logistics centres and is home to Australia's largest container port in both size and quantity, largest public transport system, most advanced road and rail infrastructure and Australia's largest curfew-free freight and passenger airport that is open for business 24 hours a day, seven days a week.
- Melbourne ranks among the safest cities in the Asia-Pacific region.
- Nearly 50 per cent of Melbourne's residents were born overseas, making Melbourne one of the most multicultural areas of Victoria.
- Easy transport to some of Australia's most iconic locations like the MCG, the National Gallery of Victoria and several of Melbourne's universities.

4.2   Population and Demographics

City of Melbourne's, City of Port Phillip's and City of Yarra's population peaked in 2020 and as at June 2021 respectively their populations were estimated at 153 674 persons, 103 508 persons and 91 543 persons[4]. Collectively the combined population was 348 725 persons. Following international impact of COVID-19 population is expected to rebound quickly and grow progressively to 2031 and beyond.

Table 2: Population Metrics - City of Melbourne, City of Port Phillip and Yarra City Council

	2016	2017	2018	2019	2020	2021
Estimated resident population (no.)						
City of Melbourne	146,096	156,000	163,462	169,122	170,806	153,674
City of Port Phillip	108,627	109,488	110,676	111,710	110,480	103,508
Yarra City Council	92,894	94,465	95,440	96,459	96,547	91,543
Total	347,617	359,953	369,578	377,291	377,833	348,725
Population density (persons/km2)						
City of Melbourne	3 891.2	4 155	4 353.7	4 504.5	4 549.3	4 093.0
City of Port Phillip	5 269.5	5 311.3	5 368.9	5 419.1	5 359.4	5 021.2
Yarra City Council	4 753.5	4 833.9	4 883.8	4 936	4 940.5	4 684.4
Median age - persons (years)						
City of Melbourne	28.3	28.6	28.9	29.3	29.8	30.5
City of Port Phillip	35.9	36.3	36.7	37.2	37.8	38.1
Yarra City Council	33.4	33.6	33.7	33.9	34.2	34.5
Working age population (aged 15-64 years) (%)						
City of Melbourne	86.8	86.6	86.5	86.5	86.3	86.1
City of Port Phillip	76.8	76.3	75.9	75.6	75.3	75.3
Yarra City Council	78.3	78.2	78.2	78.3	78.1	77.8

Source: ABS & AEAS 2023[5]

Melbourne has high population density needing efficient transport solutions. In 2021 City of Melbourne's population density was estimated 4,093 persons per km, City of Port Phillip was estimated at 5,021.2 persons per km and Yarra City Council 4,684.4 persons per km[6].

Melbourne has young population with higher take up of newer transport options. City of Melbourne's median age is 30.5, City of Port Phillip median age is 38.1 and Yarra City Councils median age is 34.5.[7]

Melbourne has a significant working age population needing transport options to their working place. 86.1 per cent of the City of Melbourne's population is aged between 86.1 per cent, City of Port Phillip is 75.3 per cent and Yarra City Council's is 77.8 per cent.[8]

4.3   Melbourne's Economy

Melbourne has a modern and diversified economy driving economic growth estimated at 4.73 per cent per annum across the City of Melbourne, City of Port Phillip and Yarra City Councils[9]. Melbourne accounts for nearly a quarter of Nation's economic activity (23 per cent of the national GDP) while only being 3 per cent of Australia's total land mass[10].

Table 3: City of Melbourne, City of Port Phillip and Yarra City Council Regional Gross Product –$ millions nominal prices

	City of Melbourne	City of Port Phillip	Yarra City Council	Total
2011	$53,431	$10,909	$8,488	$72,829
2012	$60,174	$9,188	$8,709	$78,070
2013	$62,361	$9,543	$9,084	$80,988
2014	$63,366	$9,811	$9,272	$82,448
2015	$64,852	$10,057	$9,536	$84,444
2016	$72,725	$11,470	$10,829	$95,024
2017	$84,089	$12,417	$11,587	$108,093
2018	$89,194	$13,137	$12,142	$114,473
2019	$94,924	$13,923	$12,790	$121,637
2020	$97,082	$14,153	$13,195	$124,430
2021	$96,615	$14,084	$13,205	$123,904
Decade Growth	80.8%	29.1%	55.6%	70.1%

Source: Remplan & AEAS 2023[11]

Melbourne attracts investment from all over the globe across many industries, including digital technologies, advanced manufacturing, health and life sciences, clean energy and research and development. Melbourne is home to 50 per cent of the nation's leading universities (Melbourne University, Monash University, Latrobe University and the Royal Melbourne Institute of Technology).[12]

The top three employing industries across the three councils are professional, scientific and technical services; financial and insurance services; and health care and social assistance. These industries employ a total of 242,724 workers accounting for 39.1 per cent of total jobs.[13]

Table 4: Employment by Industry City of Melbourne, City of Port Phillip and Yarra City Council, Persons

	City of Melbourne	City of Port Phillip	Yarra City Council	Total
Accommodation & Food Services	31,239	6,078	7,128	44,445
Administrative & Support Services	20,389	4,386	2,522	27,297
Agriculture, Forestry & Fishing	697	259	149	1,105
Arts & Recreation Services	17,450	2,743	1,665	21,858
Construction	17,588	6,733	5,578	29,899
Education & Training	29,854	3,750	4,342	37,946
Electricity, Gas, Water & Waste Services	9,250	269	960	10,479
Financial & Insurance Services	63,483	5,505	3,337	72,325
Health Care & Social Assistance	35,852	6,538	15,301	57,691
Information Media & Telecommunications	25,910	3,101	2,555	31,566
Manufacturing	11,760	3,351	3,582	18,693
Mining	1,836	418	37	2,291
Other Services	9,802	3,258	2,726	15,786
Professional, Scientific & Technical Services	83,503	15,805	13,400	112,708
Public Administration & Safety	44,532	2,182	2,487	49,201
Rental, Hiring & Real Estate Services	8,518	2,631	1,659	12,808
Retail Trade	20,434	5,880	10,449	36,763
Transport, Postal & Warehousing	17,982	3,630	3,239	24,851
Wholesale Trade	7,386	2,882	3,243	13,511
Total	457,465	79,399	84,359	621,223

Source: Remplan & AEAS 2023[14]

The number of registered businesses as at 30 June 2021, within the City of Melbourne, City of Port Phillip and Yarra City Councils is estimated at 78,303 with 97.2 per cent of them defined as being a small business. As at 30 June 2021, 22.9 per cent of businesses were in the Professional, scientific and technical services industry, 14.9% in Rental, hiring and real estate services industry; and 11.6 per cent were in financial and insurance services.[15]

Table 5: Registered businesses by year, City of Melbourne, City of Port Phillip and Yarra City Council, 30 June 2021

	2017	2018	2019	2020	2021
City of Melbourne	35 533	37 471	38 759	40 490	41 418
City of Port Phillip	19 475	20 200	20 673	20 840	21 047
Yarra City Council	14 267	14 908	15 264	15 553	15 838

Source: Remplan & AEAS 2023[16]

Table 6: Registered businesses by industry, City of Melbourne, City of Port Phillip and Yarra City Council, 30 June 2021

	City of Melbourne	City of Port Phillip	Yarra City Council	Total
Agriculture, forestry and fishing	448	193	114	755
Mining	162	38	12	212
Manufacturing	734	365	444	1,543
Electricity, gas water and waste services	171	61	61	293
Construction	3,319	2,294	1,259	6,872
Wholesale trade	2,004	1,162	1,202	4,368
Retail trade	1,338	718	576	2,632
Accommodation and food services	2,576	1,002	1,034	4,612
Transport, postal and warehousing	1,049	565	484	2,098
Information media and telecommunications	665	576	495	1,736
Financial and insurance services	6,342	1,782	943	9,067
Rental, hiring and real estate services	6,282	3,383	1,988	11,653
Professional, scientific and technical services	9,438	4,789	3,667	17,894
Administrative and support services	1,931	968	578	3,477
Public administration and safety	70	51	19	140
Education and training	852	378	273	1,503
Health care and social assistance	2,358	1,468	1,493	5,319
Arts and recreation services	561	516	599	1,676
Other services	1,043	689	566	2,298
Number of businesses by industry - total	41,418	21,047	15,838	78,303

Source: Remplan & AEAS 2023[17]

4.4 Melbourne Commuting

In respect to how Melbourne's workers get to their workplace the absolute majority of Melbournians commute to work via a car or taxi 259,756 persons or 41.8 per cent. In addition a significant portion of greater Melbourne also commute to inner Melbourne via passenger vehicle.[18]

Table 7: Method Travel to Work, City of Melbourne, City of Port Phillip and Yarra City Council - persons

Method of Travel to Work	City of Melbourne	City of Port Phillip	Yarra City Council	Total
(One method) Train	122,358	4,830	8,745	135,933
(One method) Bus	7,022	419	1,233	8,674
(One method) Ferry	39			39
(One method) Tram (includes light rail)	38,491	4,773	3,958	47,222
(One method) Taxi	782	84	104	970
(One method) Car, as driver	124,647	44,605	43,032	212,284
(One method) Car, as passenger	11,200	2,158	1,980	15,338
(One method) Truck	287	161	103	551
(One method) Motorbike/scooter	2,769	387	416	3,572
(One method) Bicycle	15,200	2,152	3,515	20,867
(One method) Other	1,447	354	203	2,004
(Two methods) Train and Bus	10,588	515	788	11,891
(Two methods) Train and Tram	8,896	2,498	1,669	13,063
(Two methods) Train and Other	1,545	42	144	1,731
(Two methods) Train and Car as driver	23,341	611	1,158	25,110
(Two methods) Train and Car as passenger	4,133	95	195	4,423
(Two methods) Bus and Tram	980	192	186	1,358
(Two methods) Bus and Other	21			21
(Two methods) Bus and Car as driver	348	3	21	372
(Two methods) Bus and Car as passenger	77	3		80
(Two methods) Ferry and Other	3	3		6
(Two methods) Tram and Other	2,205	208	177	2,590
(Two methods) Taxi and Other	135	16	4	155
(Two methods) Car and Other	842	92	90	1,024
(Two methods) Motorbike/scooter and Other	10			10
(Two methods) Bicycle and Other	3			3
(Three methods) Train and other two methods	8,957	1,999	1,109	12,065
(Three methods) Bus and other two methods (excludes train)	70		4	74
(Three methods) Other three methods	49		3	52
(One method) Walked only	22,922	4,036	5,534	32,492

Worked at home	8,901	3,496	2,715	15,112
Did not go to work	37,657	5,514	7,042	50,213
Method of travel not stated	1,540	153	231	1,924
Total	457,465	79,399	84,359	621,223

Source: Remplan & AEAS 2023[19]

4.5   Implications for Neuron Mobility

Melbourne's population is forecast to grow by an average 3.0 per cent each year across the period to 2040 and jobs growth is forecast to grow by an average 2.1 per cent each year across the period to 2040.[20] Accordingly City of Melbourne, City of Port Phillip and Yarra City Councils represent an attractive and significant market for shared e-scooter operations. An efficient transport network is critical to sustaining economic success in modern economies such as Melbourne's. The transport network facilitates physical mobility and enhances communities' access to a wide range of economic, social, cultural and recreational activities.

However the impressive social and economic performance of Melbourne comes at a price. Melbourne is experiencing deteriorating overall traffic network performance with growing demand only further serving to exacerbate the resulting traffic congestion and time delays that are emerging. This is unquestionably leading to a substantial economic cost. Congestion imposes significant costs on Melbourne motorists and the economy, including extra travel time, increased vehicle operating costs, and environmental costs such as poorer air quality. The Bureau of Infrastructure, Transport and Regional Economics (BITRE) has estimated the range of congestion costs for Melbourne to rise from $4.6 billion to $7.6–$10.2 billion by 2030.[21]

The combination of both population and economic growth over coming decades will serve to further compound the deteriorating traffic performance and prolonging commuting times for motorists. Greater use of shared micro-mobility solutions, paired with public transport, will help ease this congestion.

5.0   Evaluation of Economic Impacts

5.1   Methodology

The AEAS report was developed in consultation with Neuron Mobility identifying a range of vital statistics that Neuron e-scooters contributes to the Melbourne economy and Council together with growth scenarios and associated economic and environmental benefits. AEAS' approach to measuring the economic and employment contribution of Neuron Mobility's contribution to the Melbourne economy is articulated below. The economic contribution assessment for this reports considers primarily contributions to industry value added (and employment, assessed quantitatively using both survey returns and Input-Output methodology. Key aspects of AEAS methodology included:

- AEAS identified the processes and direct expenditure involved in the operation of Neuron Mobility through a comprehensive request for information (featuring the first 12 months of operations) and supplemented with detailed survey results of Neuron customers in Melbourne during the month of November 2022;
- Desktop research was undertaken to establish information currently available for Neuron and other shared micro-mobility solutions for use as a foundation and benchmarking for AEAS calculated results; and
- Estimates utilising AEAS Input-Output model were made of the direct and indirect contribution Neuron Mobility to the Melbourne economy, employment and other indicators were prepared. Direct impacts, are the first round of effects from direct operational expenditure on goods and services of Neuron Mobility. The flow-on or indirect effects (i.e. the multiplier effects) are estimated in two parts: production-induced and consumption-induced effects. The production-induced effects arise from expenditure by Neuron Mobility on goods and services supplied by other firms in Melbourne and more broadly. The consumption-induced effects arise from expenditure of Neuron Mobility employees' income on goods and services supplied by Melbourne businesses.

The adopted methodology provides an estimate of the total economic impact and employment effect of Neuron Mobility. The two types of economic impacts that have been analysed using I-O modelling in this report are Gross Value Added and employment, outlined below.

Table 8: AEAS IO model Metrics

Gross Value added	Employment
Gross value added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy. Value added for is comprised of wages and salaries, gross operating surplus of the Neuron and its indirect taxes.	A measure of employment levels (full time equivalents) required to service the demand for economic output per annum.

Source: AEAS 2023

5.2   Value Add to the Melbourne Economy

Based on AEAS modelling, in the first 12 months of operation Neuron Mobility is estimated to have directly contributed $8.49 million towards Melbourne's economy and indirectly through its supply chain and expenditure of employee wages indirectly contributed another $7.80 million. Collectively its value add to the Melbourne economy in the first twelve months was estimated at $16.29 million.

Table 9: Direct and Indirect Economic Value Add of Neuron E-Scooters in Melbourne - $ millions

	First 12 Months
Direct	$8.49 million
Indirect	$7.80 million
Total	$16.29 million

Source: AEAS 2023

5.3   Employment contribution to the Melbourne Economy

Direct employment by Neuron Mobility in the first twelve months of operations was 87 persons. Through Neuron Mobility's supply chain businesses and expenditure of employee wages another 30 jobs were indirectly created. In total 117 jobs are estimated directly and indirectly created by Neuron operations in Melbourne.

Table 10: Direct and Indirect Employment of Neuron E-Scooters in Melbourne – Persons First 12 Months

	February 2023
Direct	87
Indirect	30
Total	117

Source: AEAS 2023

5.4   Enabled Economic Contribution

Neuron Mobility's main contribution comes through the economic activity and employment that it facilitates. Neuron Mobility plays a key role as an economic enabler, facilitating the movement of people who ultimately spend money across Melbourne based cafes, restaurants, retail stores etc.

According to the Neuron Mobility Melbourne Rider Survey – 65.0% of trips result in a purchase. Of these, 37.9% of riders made a purchase as part of their latest ride at a hospitality venue; 29.7% made a purchase at a department store, supermarket or other retail store; and 16.4% visited a gym, movie or event. The average spend for each rider trip was $65.97 which is equivalent to $70,820 per e-scooter per year. All of this economic activity and spend is enabled by Neuron's e-scooters.

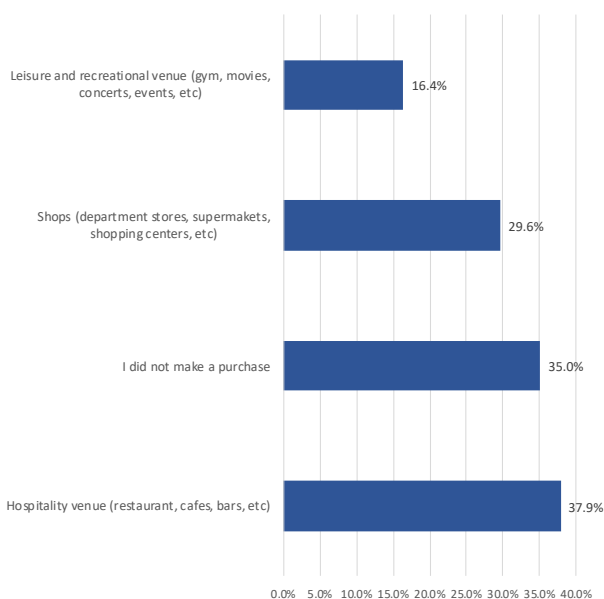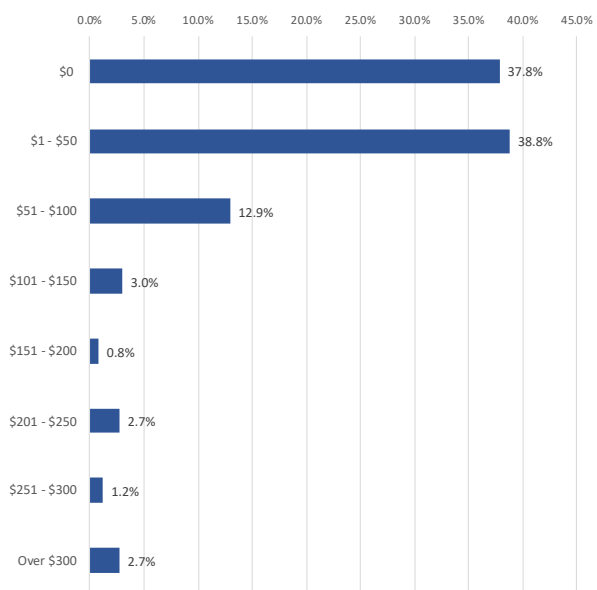Figure 6: Rider Purchasing Behaviour when riding Neuron E-Scooters

Figure 7: Value of Purchase ($) by Neuron E-Scooter Rider

Source: Neuron Mobility Melbourne Rider Survey – November 2022

As a result, in the first twelve months Neuron is estimated to have enabled $119.45 million in economic activity across Melbourne through the movement of goods and people and their resulting spend. In turn, this economic activity is estimated to have supported 687 jobs in the first twelve months.

5.5   Total Economic Contribution

In total, Neuron Mobility is estimated to have contributed $135.74 million in direct, indirect and enabled economic activity towards Melbourne's economy in its first twelve months. That is 11 cents in every $100 in Melbourne economic activity is provided and enabled by Neuron Mobility.

Table 11: Total Economic Contribution of Neuron E-Scooters in Melbourne - $ millions

	First 12 Months
Direct	$8.49 million
Indirect	$7.80 million
Enabled	$119.45 million
Total	$135.74 million

Source: AEAS 2023

In total, Neuron Mobility is estimated to have created and supported 800 Melbourne based jobs in its first twelve months.

Table 12: Total Employment Created by Neuron E-Scooters in Melbourne - persons

	First 12 Months
Direct	87
Indirect	30
Enabled	683
Total	800

Source: AEAS 2023

5.6   Economic Contribution – Estimated Future

Demand for shared micro-mobility solutions in Melbourne is expected to grow across the next five years as evidenced by section 4.0. In turn, Neuron Mobility's economic and employment contribution is also expected to increase over this period.

The expected increase in both population as well as economic, employment and tourism growth together with rising traffic congestion across the Melbourne's road network will boost demand for Neuron's e-scooters. Other factors that are anticipated to influence increased usage of shared e-scooters are provided in the below table.

Table 13 : Drivers of demand for Neuron Mobility

Demographics	Commercial Activity	Transport Options	Land Use	Demand Management	Prices
▪ Number of people (residents, employees and visitors) ▪ Employment rate ▪ Wealth/incomes ▪ Age/lifecycle ▪ Lifestyles Preferences	▪ Number of jobs ▪ Business activity ▪ Freight transport ▪ Tourist activity	▪ Walking ▪ Cycling ▪ Public transit ▪ Ridesharing ▪ Taxi services ▪ Telework ▪ Delivery services	▪ Density ▪ Mix ▪ Walkability ▪ Connectivity ▪ Transit service proximity ▪ Roadway design	▪ Road use prioritization ▪ Pricing reforms ▪ Parking management ▪ User information ▪ Promotion campaigns	▪ Fuel prices and taxes ▪ Vehicle taxes and fees ▪ Road tolls ▪ Parking fees ▪ Vehicle insurance ▪ Transit fares

Source: Victorian Transport Policy Institute[22] and AEAS 2023

AEAS analysis indicates Neuron Mobility's direct and indirect economic contribution is expect to rise from $16.29 million in 2022-23 to $26.38 million by 2027-28. In respect to employment, Neuron Mobility's direct and indirect employment contribution will rise from 117 persons in 2022-23 to 190 persons by 2027-28.

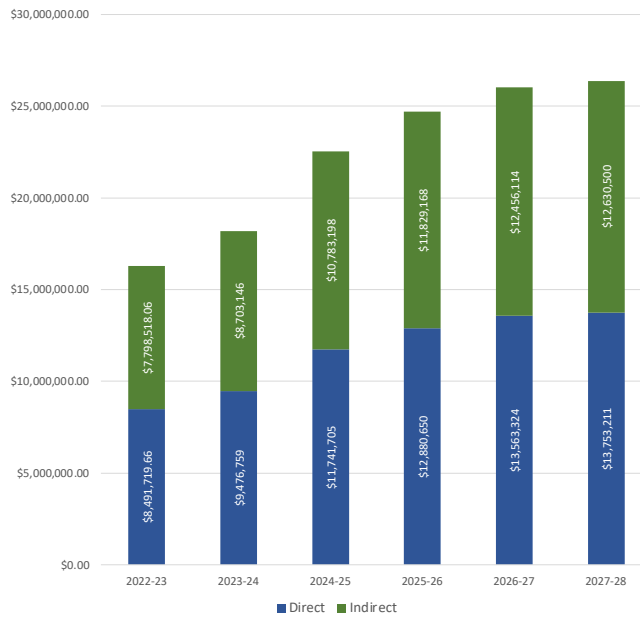Figure 8: Forecasted Direct and Indirect Economic Value Add of Neuron E-Scooters - $ millions

Figure 9: Forecasted Direct and Indirect Employment of Neuron E-Scooters– Persons
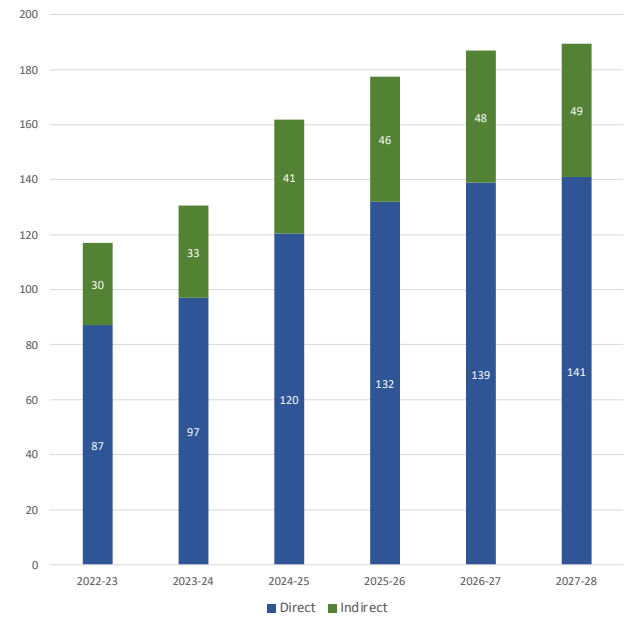
Source: AEAS 2023

In respect to enabled economic activity, AEAS analysis indicates Neuron Mobility's enabled economic contribution as a consequence of rider spend across the Melbourne economic is expected to rise from $119.45 million in 2022-23 to $193.46 million by 2027-28. In respect to employment, Neuron Mobility's enabled employment contribution will rise from 683 persons in 2022-23 to 1,106 persons by 2027-28.

Figure 10: Forecasted Enabled Economic Value Add of Neuron E-Scooters - $ millions
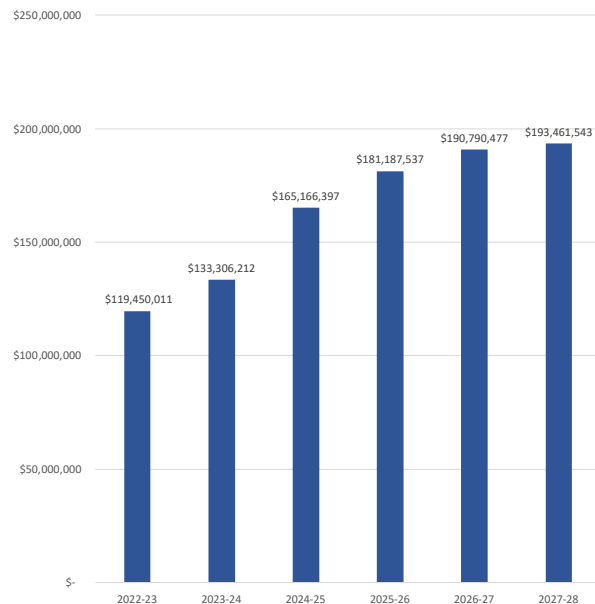
Figure 11: Forecasted Enabled Employment of Neuron E-Scooters– Persons
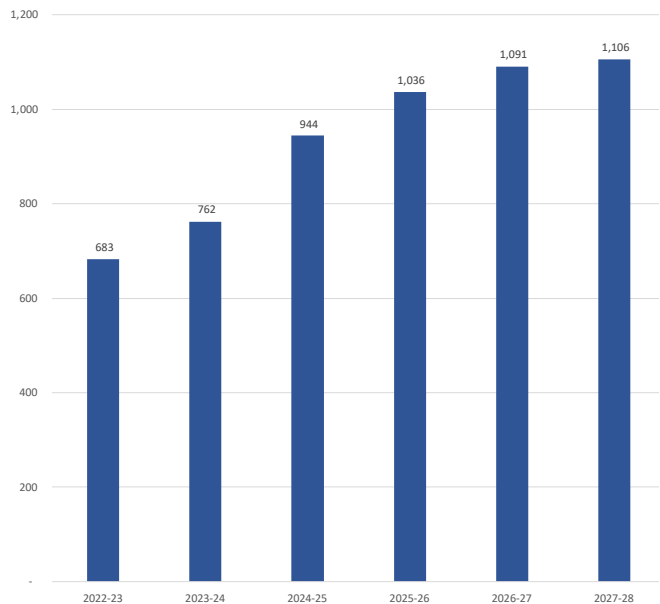
Source: AEAS 2023

In total, Neuron Mobility's estimated economic contribution towards Melbourne's economy will rise from $135.74 million in 2022-23 to $219.85 million in 2027-28. Neuron Mobility's created and supported employment will rise from 800 Melbourne based jobs in 2022-23 to 1,296 jobs by 2027-28.

Table 14: Total Economic and Employment Contribution of Neuron E-Scooters in Melbourne - $ millions / persons

	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Total Value Add	$135.74	$151.49	$187.69	$205.90	$216.81	$219.84
Total Employment	800	893	1,106	1,213	1,278	1,296

Source: AEAS 2023

6.0   Evaluation of Other Benefits

6.1   Neuron reduced overall passenger vehicle trips

Rider usage of Neuron's shared e-scooters offer a range of other tangible and quantifiable benefits to the Melbourne community. These benefits arise as a result of substitution away from usage of uber/taxi and personal car. According to the Neuron Mobility Melbourne Rider Survey – 44.7% of riders would have used either an uber/taxi or personal car if the Neuron e-scooter was unavailable. Accordingly an estimated 869,135 vehicle trips or 1,656,282 vehicle kilometres in Melbourne are estimated to be saved as a result of Neuron Mobility operations in the first year. This results in productivity benefits, reduced road costs and environmental benefits to the Melbourne community.

6.2   Productivity Benefits

E-scooters provide significant time-saving benefits that improve productivity. E-scooters help cut down on travel time by allowing riders to bypass traffic and arrive at destinations faster. E-scooters for commuting help riders go through narrow or alternative routes, which also help cut time travelling. E-scooters directly address the issue of commuters spending hours delayed in congestion resulting in a loss in productivity for businesses and individuals. In addition, riders save time and money looking for and paying for parking.

Based on the average length of time, a 1.9 km e-scooter trip takes versus a 1.9 km average passenger vehicle trip in congested traffic coupled with the removal of parking time, an overall productivity estimate of $3.38 million for Melbourne users of Neuron's E-scooters each year has been calculated. This is considered extremely conservative as it does not factor into consideration traffic standstill in the CBD that are likely to result in significantly higher time savings.[23]

6.3   Reduced Road Costs

Utilisation of shared e-scooters takes vehicles off the surrounding road network that reduces council and Victorian Government maintenance costs and reduces scale requirements for public transport and parking. Based on the number of passenger vehicle kilometres in Melbourne saved as a result of usage of Neuron's e-scooters, the three councils would save an estimated $1.29 million each year and the Victorian Government would potentially save up to $7.08 million in road costs each year.[24]

6.4   Environmental Benefits

E-scooters emit little to no carbon emissions and any $CO2$ value arises from their manufacture and charging from the electricity grid. They are significantly less harmful than vehicles. They help reduce air pollution, especially in highly density cities such as Melbourne. There are considerable environmental benefits arising from taking cars off the road as a result of substitution to Neuron's shared e-scooters. The 1,656,282 vehicle kilometres saved in the first 12 months are estimated to result in 225.7 tonnes of reduced $CO2$ emissions for the Melbourne community..[25]

7.0   Building Sustainable Future Growth for Melbourne

7.1   Establishing commercial terms that reflect benefits

AEAS has modelled increases in economic contribution under theoretical scenarios underpinned by improvement of Neuron Mobility's commercial arrangements and infrastructure delivered by Melbourne City Council. At present Neuron Mobility is paying the City of Melbourne, City of Port Phillip and the Yarra City Council for the right to operate in Melbourne.

Consultation with Neuron Mobility indicates that commercial arrangements should be reflective of the net positive benefits that are provided to the community. Figure 12 confirms that 96 per cent of users believe Neuron e-scooters have a somewhat positive, positive or extremely positive impact on Melbourne. Accordingly, Neuron believes commercial arrangements between Neuron Mobility and the three Councils can be optimised with the view to maximising economic and environmental benefits for Melbourne ratepayers.

7.2   Operational Changes Required to Lift Usage

The Neuron Mobility Melbourne Rider Survey confirms that usage of Neuron e-scooters are largely unconstrained based on user demand. Riders cite preferences for a larger operating area (51.4%) (including Kew, Hawthorn, Prahan, Northcote, Brunswick, Williamstown and Brighton), more or larger parking areas (25.1%) and better availability of e-scooters (38.5%).

At the same time usage data indicates that while more e-scooter devices will mean more trips, there is a reducing marginal rate of return for additional devices. In addition, devices in areas of lower density such as suburban areas, experience lower usage, per device; but also require greater costs based on the operator's 24/7/365 support operating model. This includes team-member trips to "rebalance" e-scooters (move them to where they are needed), battery swapping and maintenance, and responding to requests from the community.

Consultation with Neuron Mobility has indicated that a key driver of further expansion is the application of more favourable commercial terms. On the basis of more sustainable commercial terms, to the company from Melbourne City Council, Neuron would be able to invest in increased device numbers, locations and service area.
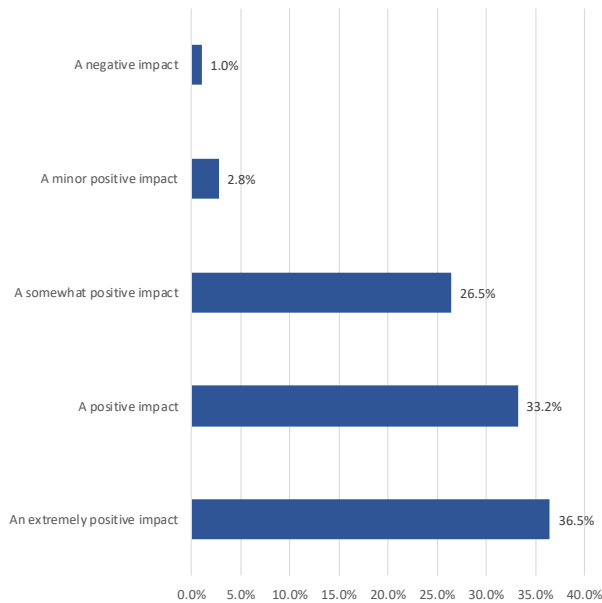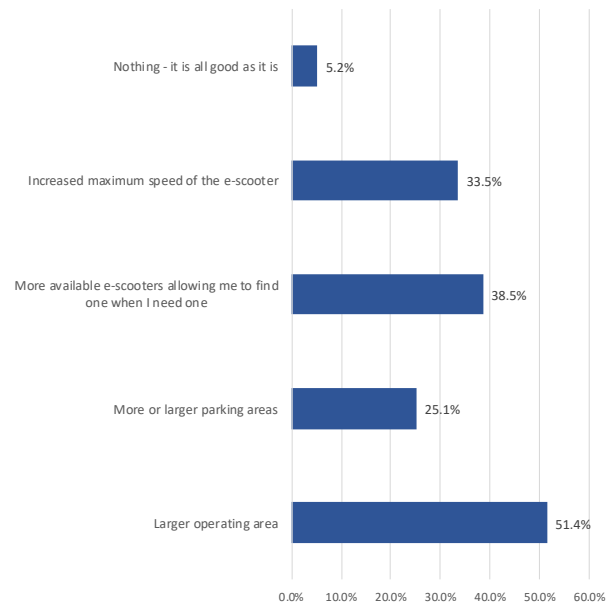
Figure 12: Rider views on Overall Impact on Melbourne

A negative impact	1.0%
A minor positive impact	2.8%
A somewhat positive impact	26.5%
A positive impact	33.2%
An extremely positive impact	36.5%

Figure 13: Changes that would deliver increase usage

Nothing - it is all good as it is	5.2%
Increased maximum speed of the e-scooter	33.5%
More available e-scooters allowing me to find one when I need one	38.5%
More or larger parking areas	25.1%
Larger operating area	51.4%

Source: Neuron Mobility Melbourne Rider Survey – November 2022

7.3   Increased Economic Activity and Employment

Neuron Mobility maintains that City of Melbourne, City of Port Phillip and the Yarra City Council together with the Victorian Government can maximise the economic and other benefits if they elect to build infrastructure and implement commercial arrangements optimising use of shared e-scooters.

Melbourne and Victoria with more favourable policies towards shared micro mobility systems (including commercial arrangements and infrastructure) could be giving the three Councils and the State Government a potential significant boost towards economic recovery as e-scooter programs generate additional economic activity, council revenues, state revenues, jobs and avoid costs.

To this end, AEAS has modelled growth scenarios, utilising Neuron Mobility's contractual and investment recommendations. That is, the economic benefits that would be realised to the Melbourne economy based on increases in rider trips.

Based on AEAS modelling, total economic activity would rise under four scenarios assuming 5%, 10%, 15% and 20% annual uplift in riders over and above existing business as usual growth:

- Business as usual sees economic contribution rise from $135.74 million in 2022-23 to $219.85 million in 2027-28 (a $84.11 million increase in economic activity);

- A 5% annual uplift in riders sees economic contribution rise from $135.74 million in 2022-23 to $280.58 million in 2027-28 (a $144.84 million increase in economic activity);

- A 10% annual uplift in riders sees economic contribution rise from $135.74 million in 2022-23to $354.06 million in 2027-28 (a $218.32 million increase in economic activity);

- A 15% annual uplift in riders sees economic contribution rise from $135.74 million in 2022-23 to $442.19 million in 2027-28 (a $306.45 million increase in economic activity); and

- A 20% annual uplift in riders sees economic contribution rise from $136.4 million in 2022-23 to $547.05 million in 2027-28 (a $411.31 million increase in economic activity).

Figure 14: Modelled Increase in Total Economic Contribution Neuron E-Scooters ($ millions)
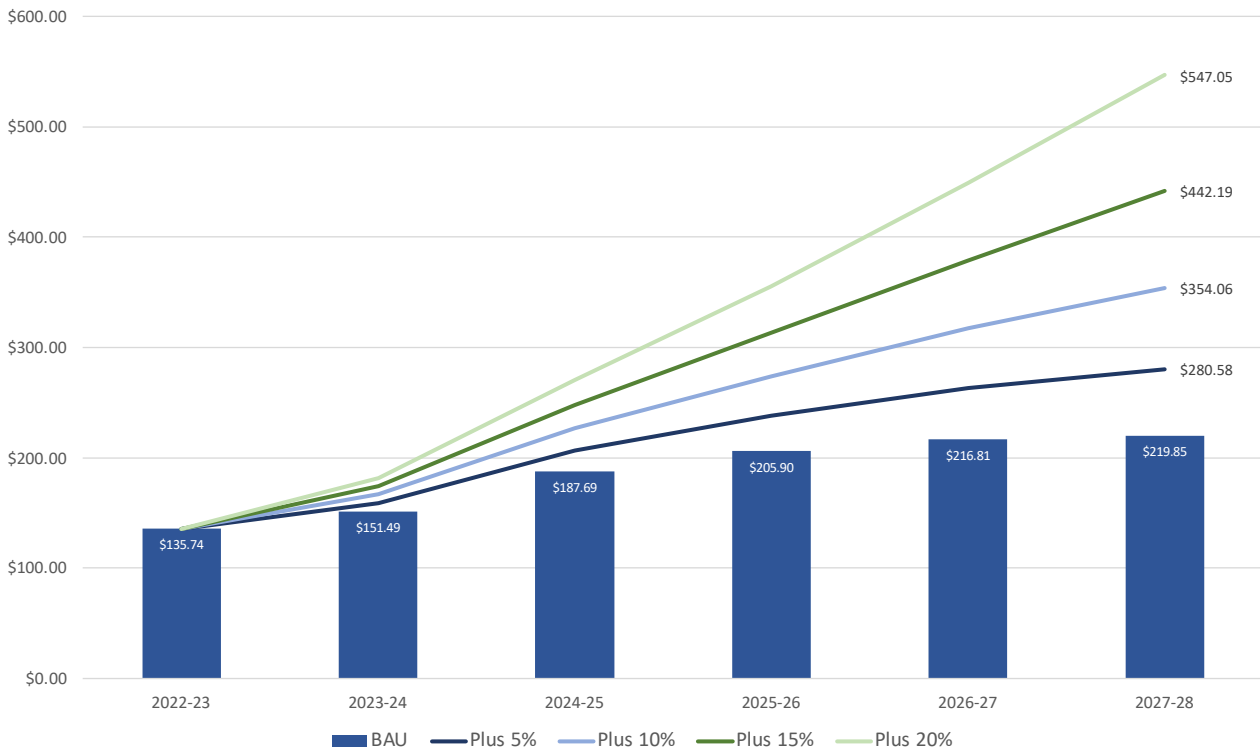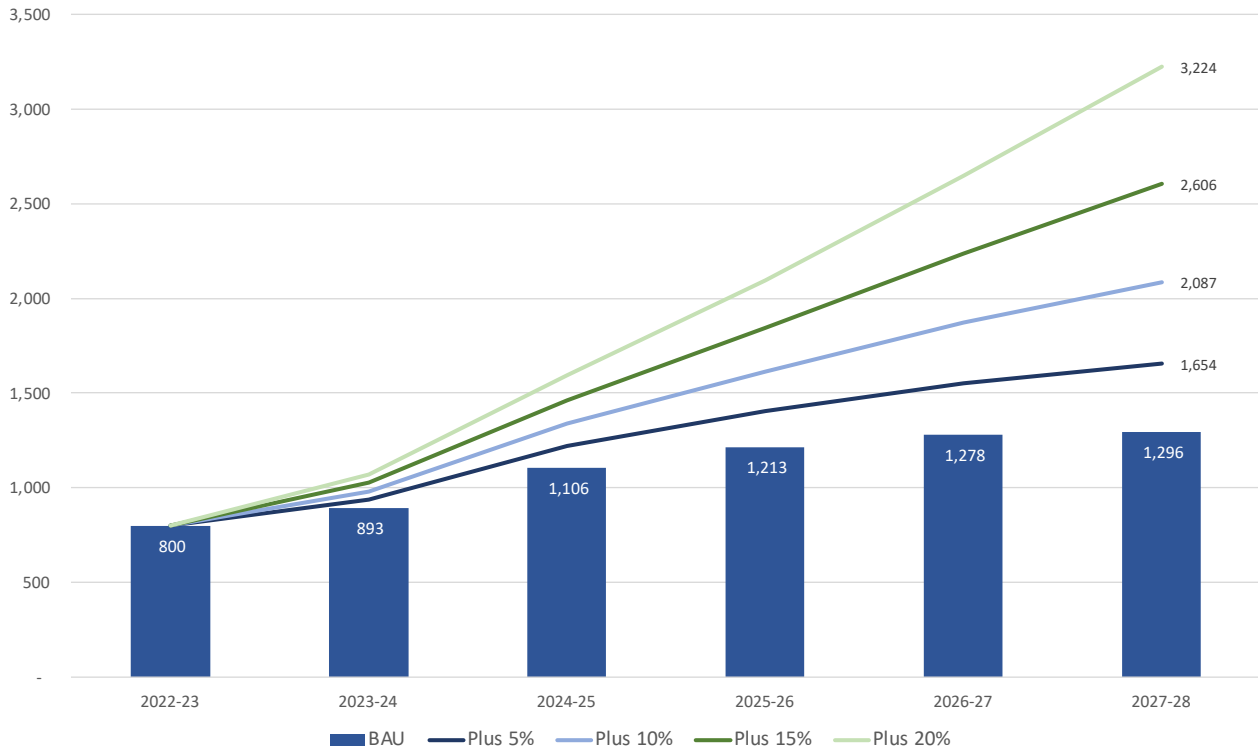

Source: AEAS 2023

Based on AEAS modelling, total employment would rise under four scenarios assuming 5%, 10%, 15% and 20% annual uplift in riders over and above existing business as usual growth:

- Business as usual sees employment contribution rise from 800 jobs in 2022-23 to 1,296 jobs in 2027-28 (an increase of 496 jobs);

- A 5% annual uplift in riders sees employment contribution rise from 800 jobs in 2022-23 to 1,654 jobs in 2027-28 (an increase of 854 jobs);

- A 10% annual uplift in riders sees employment contribution rise from 800 jobs in 2022-23 to 2,087 jobs in 2027-28 (an increase of 1,287 jobs);

- A 15% annual uplift in riders sees employment contribution rise from 800 jobs in 2022-23 to 2,606 jobs in 2027-28 (an increase of 1,806 jobs); and

- A 20% annual uplift in riders sees employment contribution rise from 800 jobs in 2022-23 to 3,224 jobs in 2027-28 (an increase of 2,424 jobs).

The assessed uplift in rider demand is based on survey feedback that 38.4% of riders have experienced a situation whereby an e-scooter or e-bike was unavailable at least half the time for their usage (31.7% of riders indicated that an e-scooter was only available about half the time, 5.0% indicated they were rarely available and 1.7% indicated they were never available). Neuron has indicated as fleet numbers increase availability will improve. On this basis, AEAS believes it is feasible for the plus 20% scenario to be achievable for Neuron Mobility and for the three councils.

Figure 15: Modelled Increase in Total Created Employment by Neuron E-Scooters (persons)

Source: AEAS 2023

If achieved, more attractive commercial arrangements offered by the City of Melbourne, City of Port Phillip and the Yarra City Council are assessed to provide an excellent economic and employment strategy for each Council. In addition, such action is anticipated to provide a range of other benefits including reduced council costs and greenhouse gas emissions for greater Melbourne.

AEAS Australian Economic Advocacy Solutions

Appendix One: AEAS Business Information

Australian Economic Advocacy Solutions delivers services in economic analysis, research and advocacy in Australia and was set up by Nick Behrens following two decades of experience applying these skills in the real world for Australia's business community. More specifically AEAS provides:

- Economic Contribution and Valuation Analysis;
- Data Analysis, Market research and Economic Modelling;
- Stakeholder Consultation; and
- Government Relations and Submissions.

AEAS delivers services nationally to exemplary organisations including Australian Industry Group, Australian Gas Industry Trust, BASF, Melbourne Airport Corporation, CCIQ, Canegrowers, IOR Pty Ltd, LifeFlight, Master Builders Australia, Natroads, Port of Melbourne, Property Council of Australia, Queensland Resources Council, RACQ, Remondis, Suncorp, VTA, Victorian Waste Management Association, unions, local government authorities, the Commonwealth and State Governments and many others.

We can be engaged for either a special project (for the entire project or just the parts our clients need help with) or on an ongoing basis. We will take the time to understand your unique challenge and create a partnership with you to tailor a solution specific to your budget. We engage with confidentiality and integrity. Choose AEAS for our expertise, professionalism and ability to work with our valued clients to achieve exceptional results.

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Across his professional career Nick has realised many outstanding outcomes to complex challenges for the business community. He possesses significant experience in gathering and presenting information, and leveraging that information to achieve results across a range of areas including economic, taxation, regulatory environment, workers compensation, employment legislation, population, infrastructure and planning issues. As Director of Australian Economic Advocacy Solutions (AEAS), Nick provides:

- Exceptional understanding of social, political and economic issues impacting on business and the economy;
- Considerable real-world application of project, business and economic research and analysis;
- Significant expertise in advocacy, including government and stakeholder relations;
- In-depth and firsthand knowledge of the workings of Government;
- Extensive networks in political, government, business and community sectors;
- Previous appointments on a number of high level Government committees; and
- Media commentator and public speaker.

Nick's representations are based on extensive research and his preferred approach to economic analysis, research and advocacy is to achieve results by working with stakeholders behind the scenes to secure positive and lasting outcomes. He places much emphasis on having a thorough and convincing evidence that is readily understood and in turn leads to real world application and solutions.

Appendix Two: References

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[10] City of Melbourne, https://www.melbourne.vic.gov.au/business/Pages/invest-melbourne.aspx

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[23] These assumptions are based on Table 3.4 in Austroads, 2012, Guide to Project Evaluation Part 4: Evaluation Data. The estimates in this table for June 2010 have been inflated to current values using ABS estimates of growth in the wage price index since then.

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