SHEPPARTON CBD COMPLIMENTARY CAR PARKING
COMPARATIVE IMPACT ANALYSIS

Prepared for:
Greater Shepparton City Council

11 March 2020

Geografia

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• Demography • Economics • Spatial Analytics

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Executive Summary

BACKGROUND

- The impact of a Council complimentary car parking policy for the Shepparton CBD has been compared with other regional council areas; two with paid car parking (Bendigo and Horsham) and two with complimentary car parking (Traralgon and Benalla).

- A Bayesian Time Series analysis has been undertaken to estimate the spending if the complimentary car parking had not been introduced into Shepparton during three 'Time Periods': Time Period 1 (2019-20), Time Period 2 (2020-21) and Time Period 3 (2021-22). Bendigo and Horsham CBDs have been used as controls as they retained paid parking.

- Spending was derived from the Spendmapp service provided to the Council by Geografia. For this study, Total Local Spend for the suburb of Shepparton was used (this is the sum of all spending by residents and visitors to the LGA filtered by time and location).

ECONOMIC CONTEXT

- The broader context for spending in Shepparton can be seen in spending data for the four regional cities. This shows similar upward trajectories interspersed with Christmas spikes and lockdown-induced troughs in spending. The Australian Bureau of Statistics retail trade survey data confirms this trend with a steady increase from November 2018 to the beginning of the Victorian lockdowns in April 2020. Lockdowns temporarily affected this trend.

- Notwithstanding the introduction of complimentary car parking in Shepparton CBD, overall spending trends did not deviate from the overall spend trend for each of the four regional cities.

RESULTS

- Factoring in the uncertainty related to forecasting, the data shows no statistically significant result for overall spending in the Shepparton SSC. That is, Total Local Spend did not increase during any of the Time Periods due to complimentary car parking.

- Although the complimentary car parking did not influence Total Local Spend, some evidence shows that particular merchant types may have benefited. Disaggregating into Expenditure Category shows that five Categories had a significant positive impact. That is an increase in spending in one or more of the time periods (see Table below).

	Positive Impact		
Expenditure Category	2019-20	2020-21	2021-22
Department Stores & Clothing	✗	✗	✓
Grocery Stores & Supermarkets	✓	✗	✗
Specialised & Luxury Goods	✓	✓	✓
Specialised Food Retailing	✗	✗	✓
Travel	✗	✓	✗
All other investigated categories	✗	✗	✗

- In conclusion, some merchants appear to have benefited from the complimentary car parking policy in some of the Time Periods. However, foregoing the car parking revenue will have incurred an opportunity cost for the Council (in terms of lost revenue, which could be used to implement more comprehensive local economic development initiatives).

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1.0   Introduction

- This briefing paper summarises the findings of a second analysis of the impact of a Council complimentary car parking policy for the central CBD of Shepparton. It uses Spendmapp data for the suburb of Shepparton and compares this with other regional council areas; two with paid car parking (Bendigo and Horsham) and two with complimentary car parking (Traralgon and Benalla).

- A brief outline of the methodology deployed is included in this paper.

- The study determines whether there was a positive impact on expenditure in the Shepparton CBD due to the introduction of complimentary parking in Council-owned parking spaces for selected Christmas Holiday periods for 2019-20, 20-21 and 21-22.

- By comparing with four other regional city locations, the analysis can account for impacts on spending due to other factors (such as inflation, population growth, bushfires and so forth).

- Bank transaction data was analysed at the daily aggregate level and using 8 Expenditure Categories for the suburbs of Shepparton, Benalla, Horsham and Traralgon (Latrobe City).

2.0   Analysis

2.1 Context

- The Australian Bureau of Statistics retail trade survey data confirms that Victorian retail businesses increased retail expenditure from November 2018 to the beginning of the Victorian lockdowns in April 2020. After this, and notwithstanding regular and significant drops in spending, the overall trajectory was still positive (Figure 1). This study seeks to determine whether spending in the Shepparton SSC during the periods of complimentary parking showed a statistically significant deviation from what it would otherwise have been.
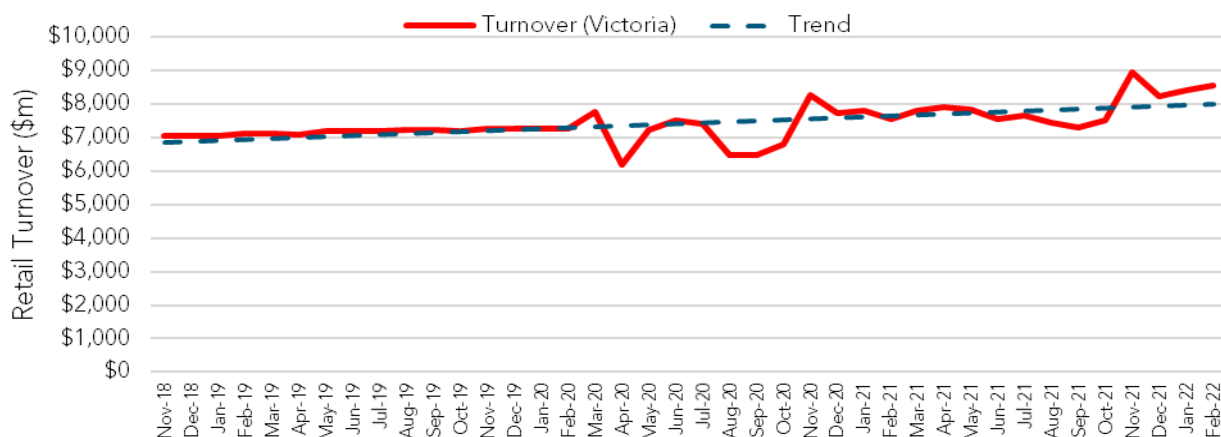

Figure 1: **ABS Retail Trade, Victoria Nov-18 to Feb-22**
This shows spending for Victorian retail trade from November 2018 through to the latest available data (February 2022). Notwithstanding the lockdown periods, the overall trajectory is positive, with Christmas 2021 being a particularly significant spike post-2021 lockdowns. Source: ABS, 2020, Catalogue No. 8501.0

- Figure 2 and Figure 3 compare Total Local Spend (All Categories) in Greater Shepparton with the benchmark LGAs for the period January 2019 to March 2022. These are provided to highlight the broadly similar spend trajectories for both sets of LGAs (complimentary and paid car parking). The relevant study periods are highlighted in grey.

- The data suggests all five LGAs have similar spending trajectories (the average r^2 value for the linear correlation between the comparison LGAs and Greater Shepparton is 0.92, with the highest being 0.97 for Latrobe City).

- As expected, spending increases in all jurisdictions during the Christmas periods.

- Over the entire time series from January 2019 to March 2022, spending in Greater Shepparton increased by an average of 1.6% per month. This was in the middle of the spending increase range, with Bendigo and Horsham averaging a 1.9% increase per month, Latrobe at 1.5% and Benalla at 1.4% per month.
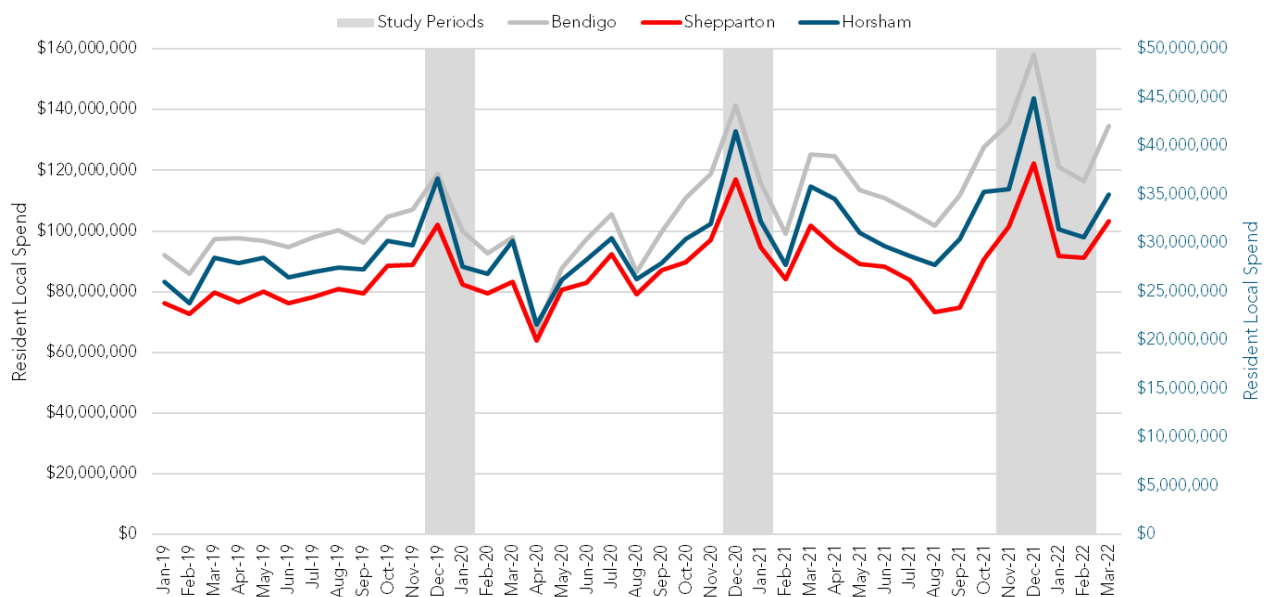

Figure 2: **Comparative Total Local Spend (paid car parking)**
This compares Greater Shepparton LGA monthly Total Local Spend with the LGAs with paid car parking. Note that to account for the scale of its economy, Horsham (in blue) is plotted on the right-hand axis. Source: Spendmapp by Geografia, 2022
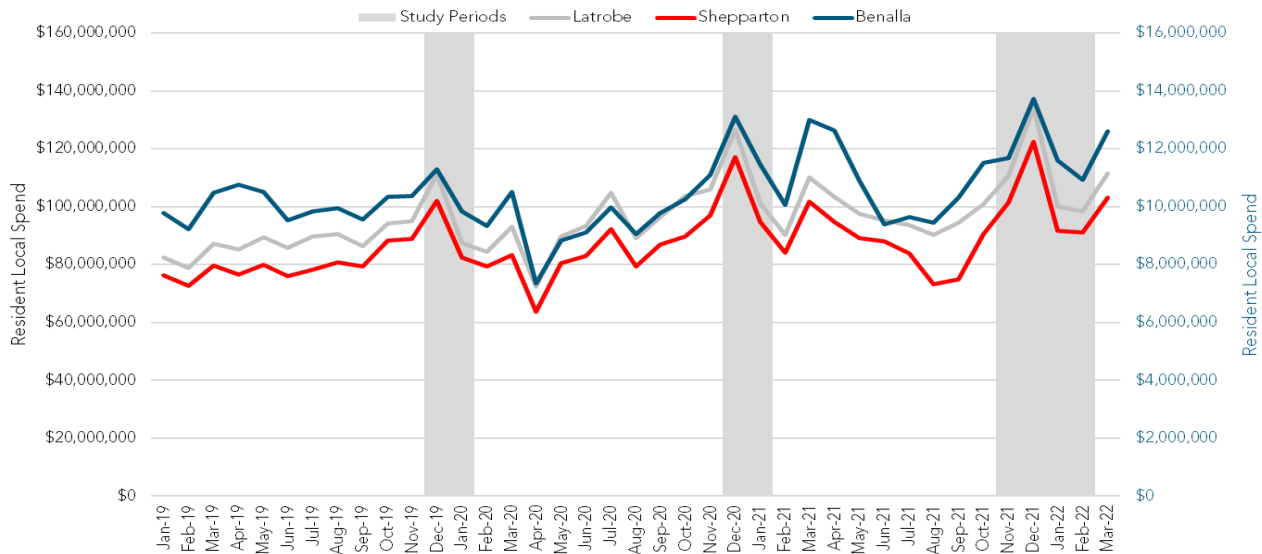
Shepparton Parking | Impact Analysis | 2

Figure 3: **Comparative Total Local Spend (complimentary car parking)**
This compares Greater Shepparton LGA monthly Total Local Spend with the LGAs with complimentary car parking. Note that to account for the scale of its economy, Benalla (in blue) is plotted on the right-hand axis. Source: Spendmapp by Geografia, 2022

2.2 Modelling

- A Bayesian Structural Time Series model was used to identify any impact of complimentary parking in Shepparton on local spending. The suburb boundary of Shepparton SSC was used for the data collection[1] (Figure 4). This means the analysis includes expenditure in other commercial areas, such as the Shepparton Marketplace, which may have skewed the results for particular merchant types.

- The suburbs of Horsham and Bendigo (within Bendigo LGA) have paid parking and are used as the control group for comparison[2]. The suburbs of Traralgon and Benalla, which have complimentary car parking, are used as benchmarks rather than controls as the intention is to determine whether a switch from paid to complimentary car parking in Shepparton had any effect.

- The method compares the actual expenditure during the study periods (i.e. the periods during which complimentary car parking was available) with a predicted expenditure trajectory for the same periods assuming paid parking continued. The predicted values have an uncertainty band around them (a 95% confidence interval). Subtracting the predicted value from the actual value produces an estimated difference in spending during in the complimentary car parking periods than would have occurred if complimentary car parking were not introduced.

- The statistical model seeks to identify any impact of the switch from paid to complimentary car parking in Shepparton Suburb (SSC) for all Expenditure Categories combined. It uses daily Total Local Spend as the Expenditure Type. Each Expenditure Category was also investigated separately.

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[1] Due to data thresholds designed to protect merchant privacy, data must be aggregated to suburb level. Data at smaller geographical areas is available (e.g. down to a single retail strip. However, this requires manual auditing to ensure the data thresholds are met.

[2] Ideally the control group would be composed of significantly more regional cities with paid parking to ensure we account for all potential external influences on spending. Alternatively, custom geofenced data extracts can also improve the reliability of the modelling.
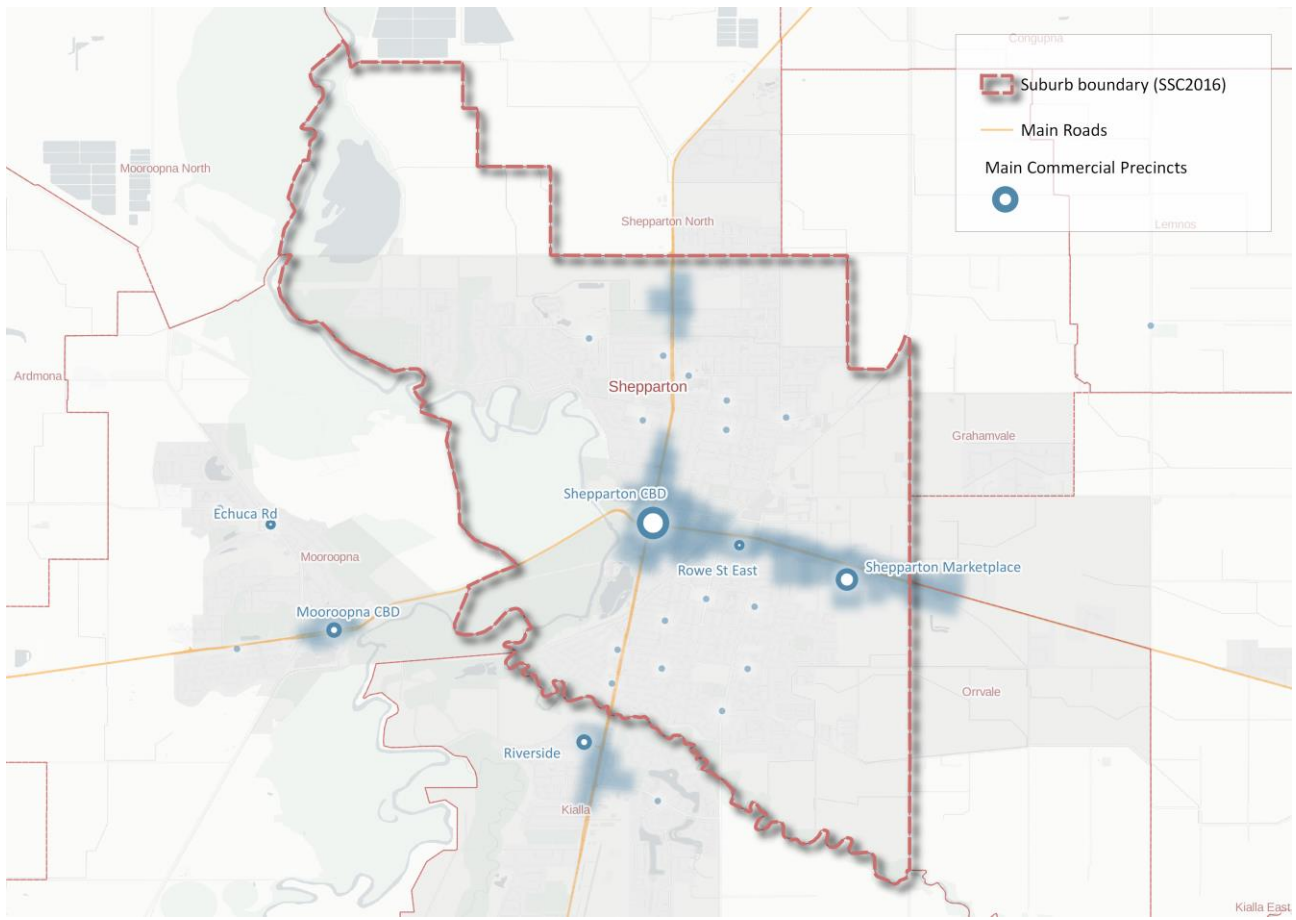
Figure 4: **Shepparton Study Area**
This shows the study area used for data aggregation in Shepparton. Source: Geografia, 2022

- Analysis is undertaken for each Christmas period (Time Periods 1, 2 and 3). The specific dates are:
  - o Time Period 1: 2 December 2019 to 31 January 2020
  - o Time Period 2: 1 December 2020 to 31 January 2021
  - o Time Period 3: 1 November 2021 to 28 February 2022
- As we are looking for the impact of a switch in car parking policy towards complimentary car parking, the control group is the pair of suburbs that did not switch (that is, Bendigo SSC and Horsham SSC). The two other regional city CBDs are used for benchmarking spend trends only.

2.3 Results

- Analysis has been undertaken for each Time Period. The results are below.

HOW TO INTERPRET THE RESULTS

- The model predicts what would have happened to spending if the complimentary car parking policy had not been implemented (using Bendigo and Horsham - which did not introduce complimentary car parking - to estimate the likely spend trend in Shepparton without complimentary car parking). It then compares this with what happened in Shepparton. The cumulative difference (Actual minus the Predicted) is plotted, along with a 95% confidence interval that accounts for the uncertainty in the model.

- To conclude that a statistically significant positive impact has occurred (i.e. an increase in spend due to complimentary car parking), the chart, including its entire confidence interval, needs to be above the zero horizontal axis. This axis represents where the predicted impact and actual spend are the same value, and the difference is zero.

- Where the line and its confidence interval intersect with the axis, we can conclude that there was no statistically significant effect on spending as a result of the introduction of complimentary cark parking. Instead, we can assume any variation is due to random chance and the typical volatility of daily/Christmas spending.

TOTAL LOCAL SPEND TIME PERIOD DEC-19 TO JAN-20

- Figure 5 shows the Actual minus the Predicted expenditure for Time Period 1 for Total Local Spend in Shepparton SSC (it includes data for November 2019 to provide a visual baseline). The red line is the difference between the predicted and actual spend, and the grey band is the 95% confidence interval[3].

- Although the red line suggests there is an indication of a positive increase in spending in the week immediately preceding Christmas, as the confidence interval shows, we can only conclude that this was due to chance, that is, a random fluctuation in spending, rather than as a result of the introduction of complimentary car parking.
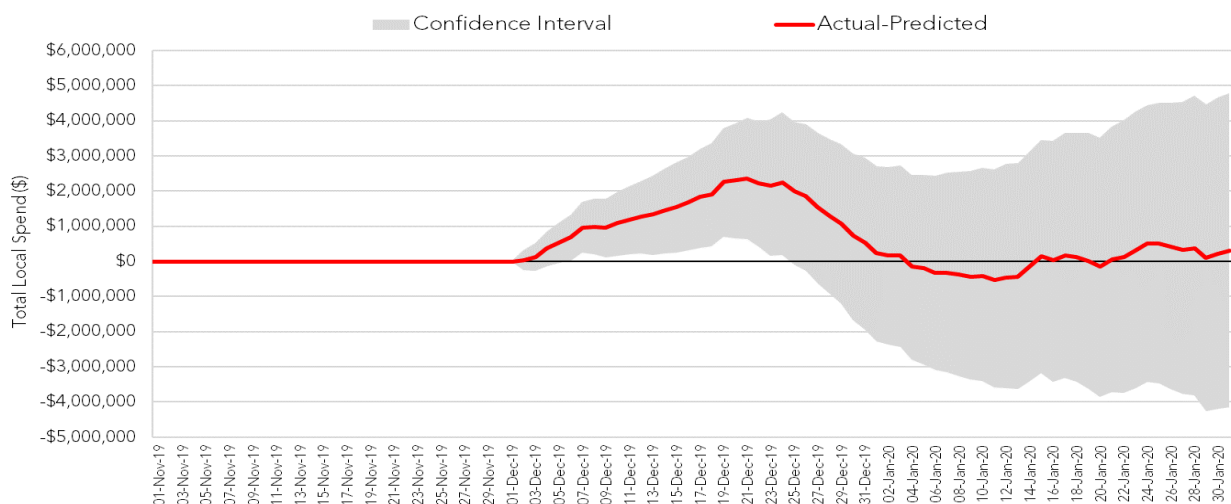

Figure 5: Total Local Spend (All Categories, All Hours), Time Period 1
This plots the cumulative difference between actual and predicted spend, with the latter predicted if complimentary car parking had not occurred. Source: Geografia, 2022

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[3] That is, we can be 95% confident that had complimentary parking not been implemented, the actual expenditure would have fallen within this range.

TOTAL LOCAL SPEND TIME PERIOD 2 DEC-20 TO JAN-21

- Figure 6 shows the same model outputs for the second time period.
- As with Time Period 1, there is an indication of a change in spending, but this change in spending is not statistically significant. Again, the conclusion is that actual spending variation compared with predicted is due to random fluctuations rather than the complimentary car parking policy.
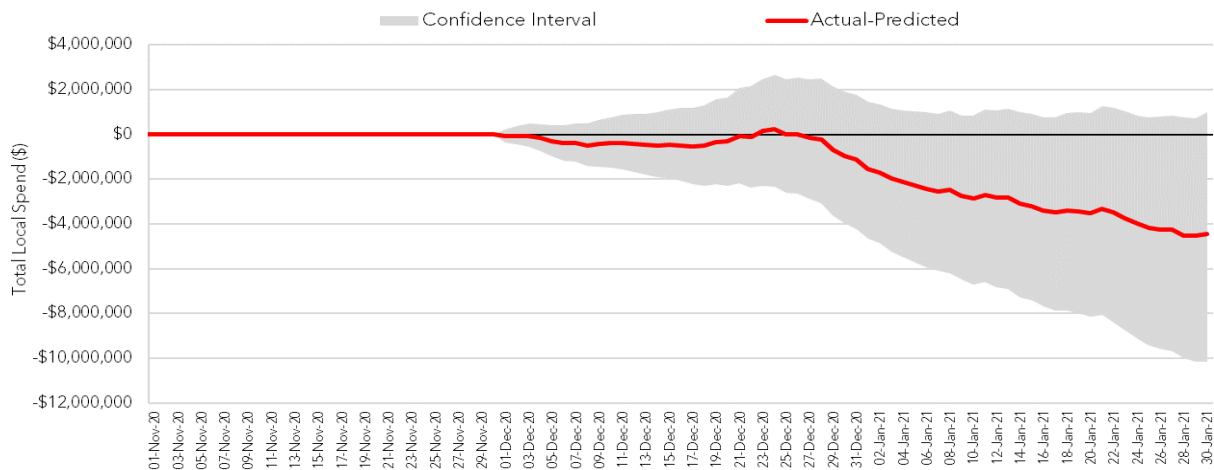

Figure 6: **Total Local Spend (All Categories, All Hours), Time Period 2**
Source: Geografia, 2022

TOTAL LOCAL SPEND TIME PERIOD 3 NOV-21 TO FEB-22

- Figure 7 shows the same model outputs for the third time period.
- As with Time Period 1, there is an indication of a positive increase in spending, in this case, continuing for the entire time period. However, the change in spending is not statistically significant. The conclusion is that actual spending variation compared with predicted is due to natural variability rather than the complimentary car parking policy.
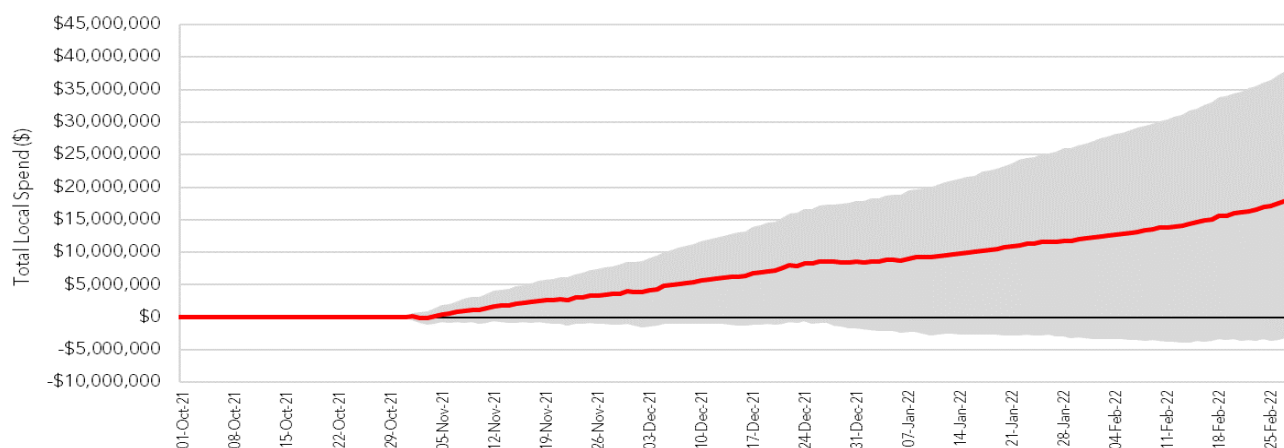
Figure 7: **Total Local Spend (All Categories, All Hours), Time Period 3**
Source: Geografia, 2022

TOTAL LOCAL SPEND CATEGORY ANALYSIS

- To determine whether particular merchant types may have benefited from complimentary car parking, the 14 Spendmapp Expenditure Categories were examined using the same Time Series model.

- Six of the 14 categories were not modelled as merchants in these categories were concentrated outside of the complimentary car parking area.

- Of the remaining eight categories:

  o Five had a significant positive impact (i.e. an increase in spending in one or more of the time periods); and

  o Three had no significant impact.

- Table 1 summarises the results. Figure 8 to Figure 12 show the spending impact for the statistically significantly affected Expenditure Categories.

Table 1: Impact Analysis by Expenditure Category

Expenditure Category	Modelled	Impact	Comment
Bulky Goods	No	n.a.	No significant merchant presence in study area
Department Stores & Clothing	Yes	Positive	Significant positive impact in 2021-22
Dining & Entertainment	Yes	n.a.	No significant impact in any time period
Furniture & Other Household Goods	No	n.a.	No significant merchant presence in study area
Grocery Stores & Supermarkets	Yes	Positive	Significant positive impact in 2019-20
Light Industry	No	n.a.	No significant merchant presence in study area
Other	No	n.a.	No significant merchant presence in study area
Personal Services	Yes	n.a.	No significant impact in any time period
Professional Services	Yes	n.a.	No significant impact in any time period
Specialised & Luxury Goods	Yes	Positive	Significant positive impact in 2019-20, 2020-21 and 2021-22

Expenditure Category	Modelled	Impact	Comment
Specialised Food Retailing	Yes	Positive	Significant positive impact in 2021-22
Trades and Contractors	No	n.a.	No significant merchant presence in study area
Transport	No	n.a.	No significant merchant presence in study area
Travel	Yes	Positive	Significant positive impact in 2020-21

Impacted categories are highlighted. Source: Geografia, 2022

- Figure 8 shows the impact on Department Stores and Clothing for Time Period 3 (2021-22).
- The statistically significant impact begins in mid-November 2021.
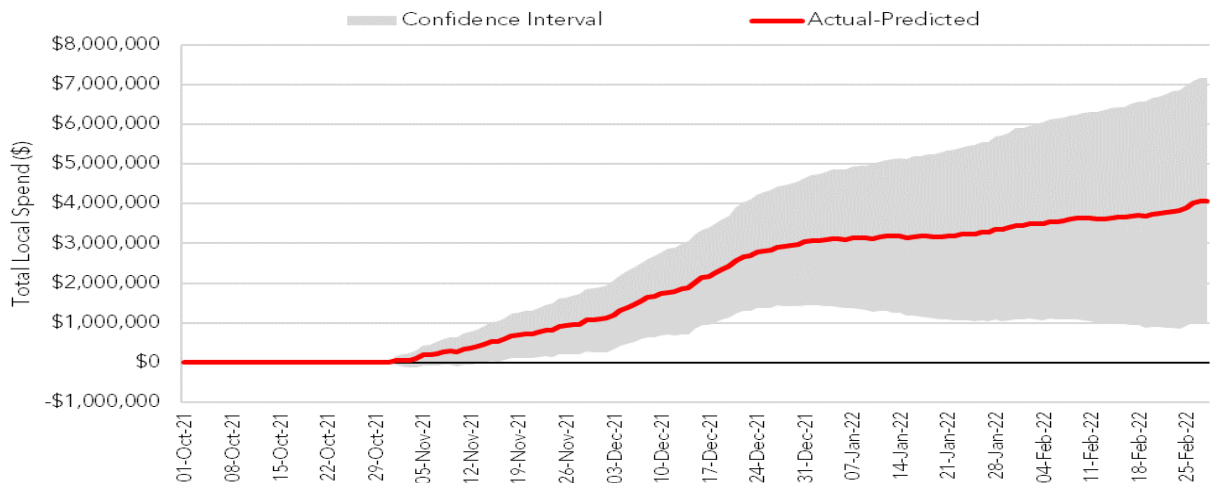- The cumulative impact is in the order of $3.5 million.

Figure 8: **Total Local Spend (Department Stores & Clothing, All Hours), Time Period 3**
Source: Geografia, 2022

- Figure 9 shows the impact on Grocery Stores & Supermarkets for Time Period 1 (2019-20).
- The statistically significant positive impact commences in late January 2020.
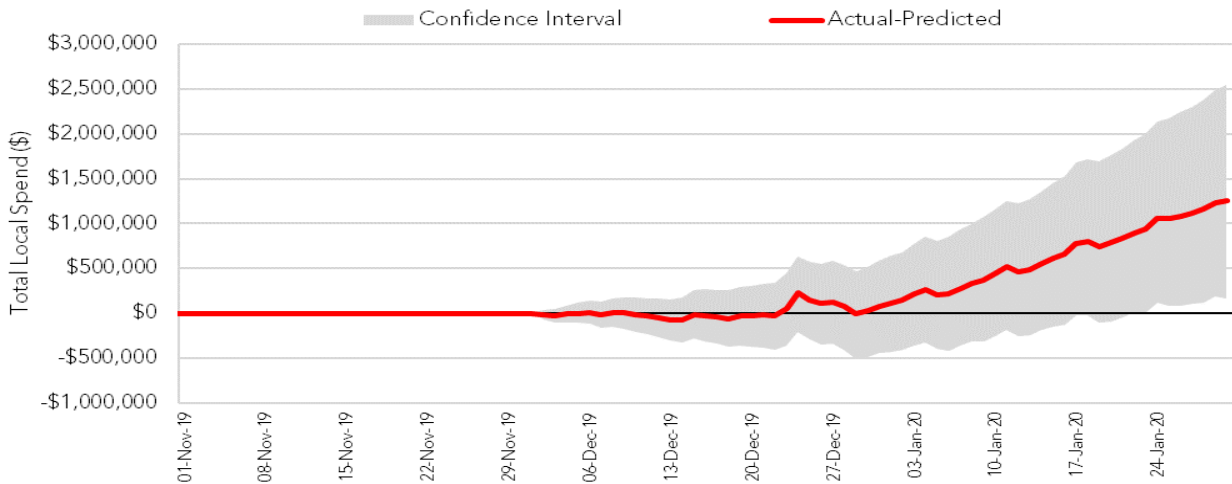- The cumulative impact is in the order of $352,000.

Figure 9: **Total Local Spend (Grocery Stores & Supermarkets, All Hours), Time Period 1**
Source: Geografia, 2022

- Figure 10 shows the impact on Specialised and Luxury Goods for Time Periods 1 (2019-20), 2 (2020-21) and 3 (2021-22).

- The statistically significant positive impacts commence soon after the complimentary parking periods begin.

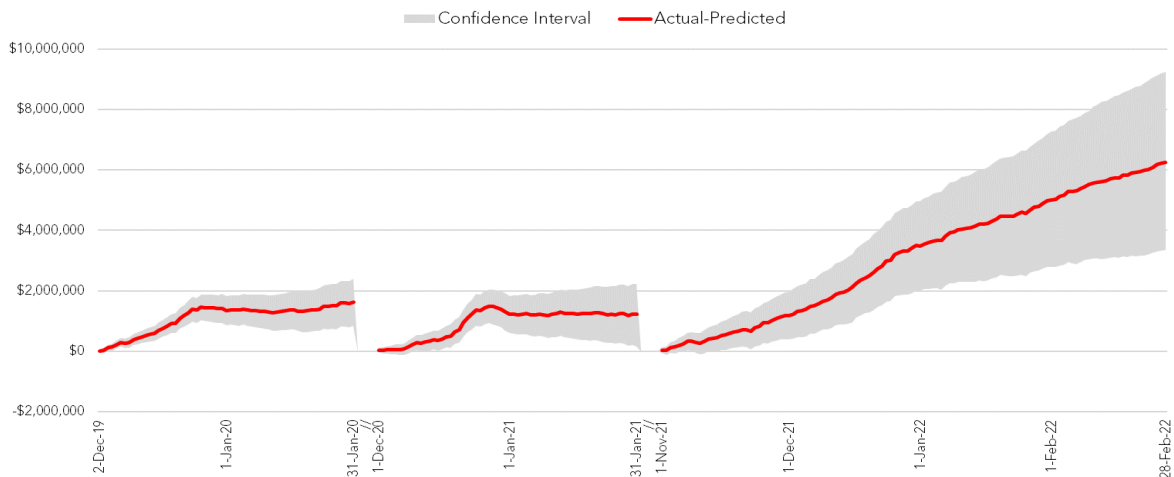- The cumulative impact for all three Time Periods is $8.3 million.

Figure 10: **Total Local Spend (Specialised & Luxury Goods, All Hours), Time Periods 1, 2 and 3**
Note these time periods have been truncated. Source: Geografia, 2022

- Figure 11 shows the impact on Specialised Food Retailing for Time Period 3 (2021-22).

- The statistically significant impact begins around Christmas 2021.
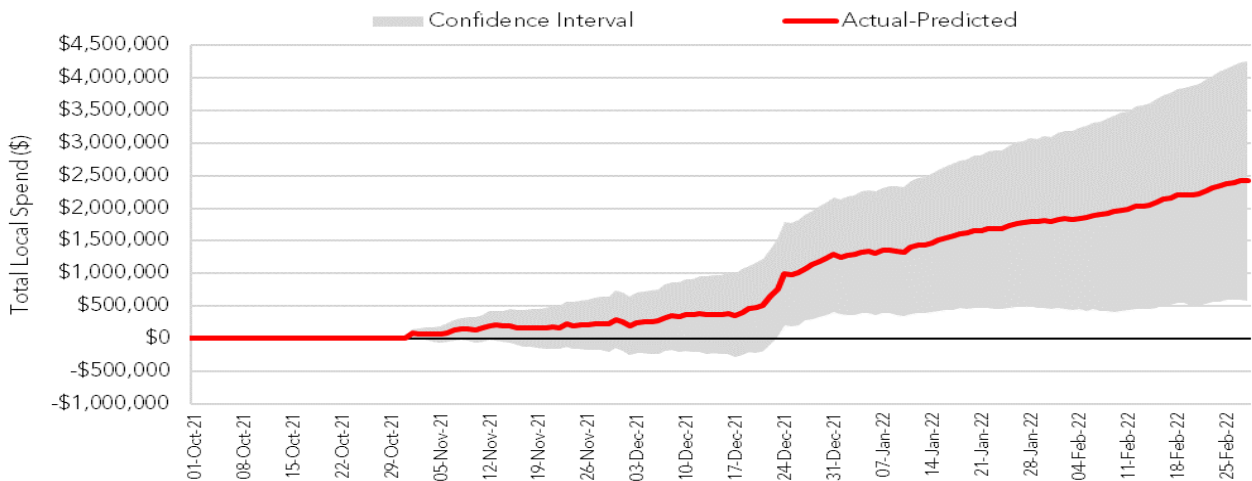
- The cumulative impact is in the order of $1.6 million.

Figure 11: Total Local Spend (Specialised Food Retailing, All Hours), Time Period 3
Source: Geografia, 2022

- Figure 12 shows the impact on Travel spending for Time Period 2 (2020-21).
- The statistically significant impact begins in early January 2021.
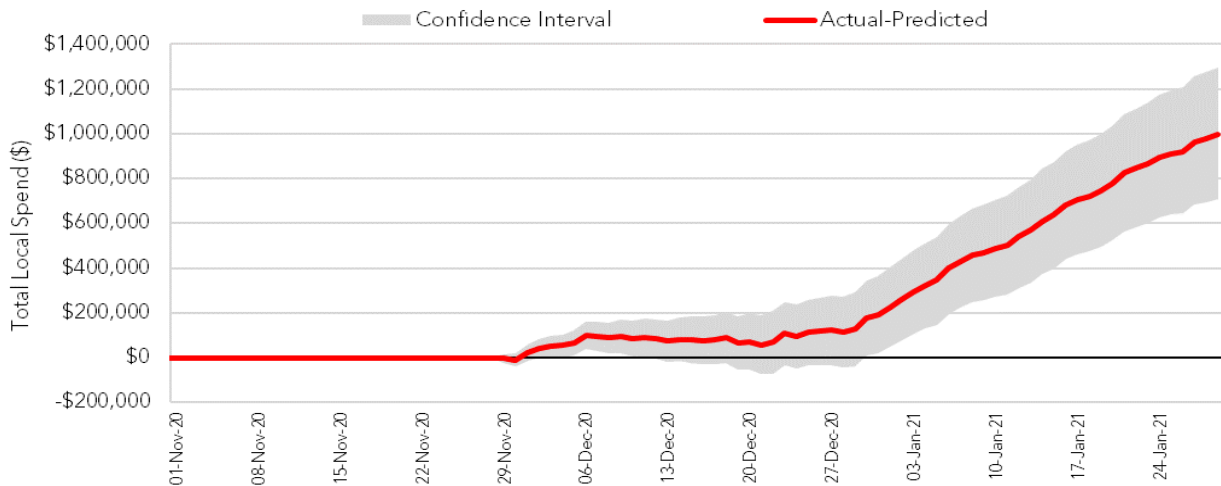- The cumulative impact is in the order of $800,000.

Figure 12: Total Local Spend (Travel, All Hours), Time Period 2
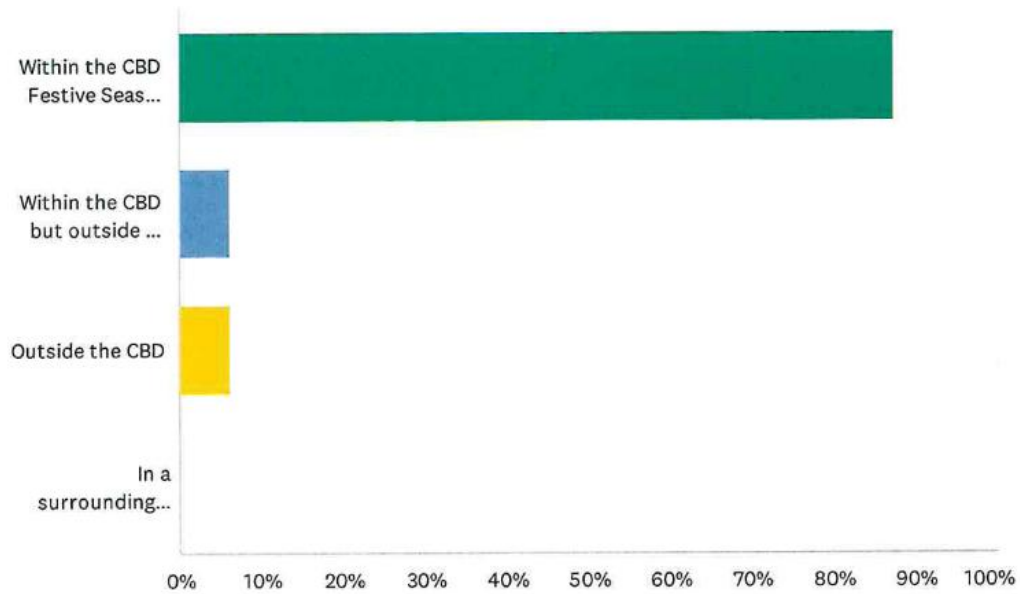Source: Geografia, 2022

3.0   Conclusion

- The modelling demonstrates that complimentary car parking does not have a statistically significant impact on cumulative (all merchant types combined) Total Local Spend in the Shepparton SSC for all three Time Periods.

- When breaking it down by Expenditure Category, the complimentary car parking initiative does appear to have had a statistically significant impact on some merchants, specifically in:

  o   Department Stores & Clothing;

  o   Specialised & Luxury Goods;

  o   Specialised Food Retailing;

  o   Grocery Stores & Supermarkets; and

  o   Travel.

- For the remaining Expenditure Categories, there is no significant effect.

- The cumulative impact across these five categories is around $14.6 million across all three time periods (cumulative eight months).

- In conclusion, some merchants appear to have benefited from the complimentary car parking policy in some of the Time Periods. However, foregoing the car parking revenue will have incurred an opportunity cost for the Council. That is, revenue has been foregone that could have been used to implement more comprehensive local economic development initiatives that could support all merchant types, including those that did not benefit from the complimentary car parking.

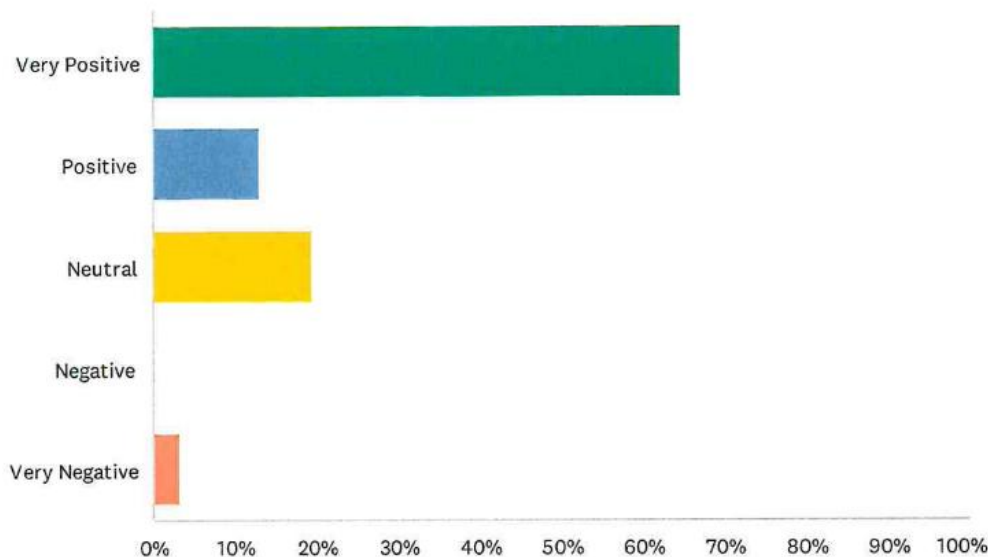Shepparton Chamber of Commerce & Industry Shepparton CBD Complimentary Parking Survey for Traders

Q1 My Business resides:

Answered: 32   Skipped: 0

ANSWER CHOICES	RESPONSES	
Within the CBD Festive Season Complimentary Timed On-Street Parking zone	87.50%	28
Within the CBD but outside the Festive Season Complimentary Timed On-Street Parking zone	6.25%	2
Outside the CBD	6.25%	2
In a surrounding small town of Greater Shepparton	0.00%	0
TOTAL		32

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Q2 Complimentary Timed On-Street Parking has had the following effect on sales:
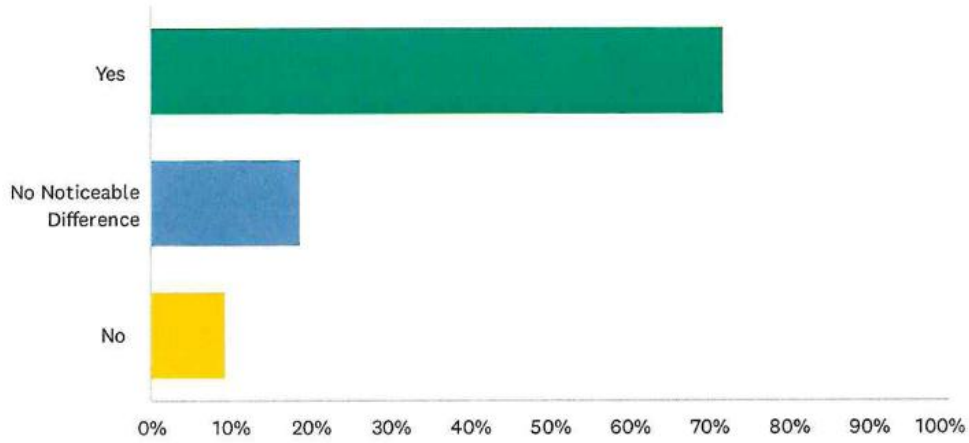
Answered: 31   Skipped: 1

ANSWER CHOICES	RESPONSES	
Very Positive	64.52%	20
Positive	12.90%	4
Neutral	19.35%	6
Negative	0.00%	0
Very Negative	3.23%	1
TOTAL		31

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Shepparton Chamber of Commerce & Industry Shepparton CBD Complimentary Parking Survey for Traders

Q3 Have you noticed more visitors from outside Shepparton?

Answered: 32   Skipped: 0

ANSWER CHOICES	RESPONSES	
Yes	71.88%	23
No Noticeable Difference	18.75%	6
No	9.38%	3
TOTAL		32

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Shepparton Chamber of Commerce & Industry Shepparton CBD Complimentary Parking Survey for Traders

Q4 Customers feedback in relation to Complimentary Timed On-Street Parking was:

Answered: 32   Skipped: 0
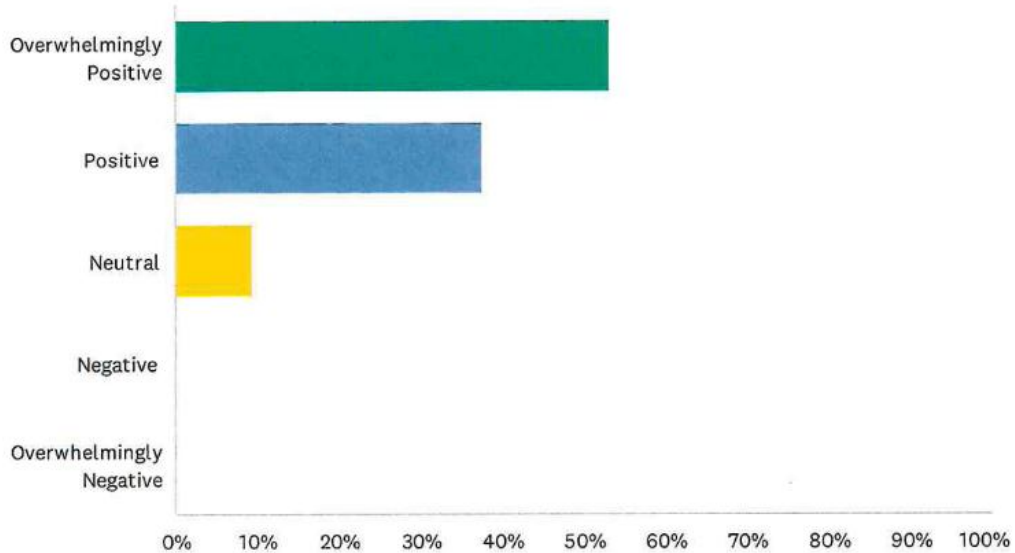
ANSWER CHOICES	RESPONSES	
Overwhelmingly Positive	53.13%	17
Positive	37.50%	12
Neutral	9.38%	3
Negative	0.00%	0
Overwhelmingly Negative	0.00%	0
TOTAL		32

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Shepparton Chamber of Commerce & Industry Shepparton CBD Complimentary Parking Survey
for Traders

Q5 Would you like to see:

Answered: 31   Skipped: 1
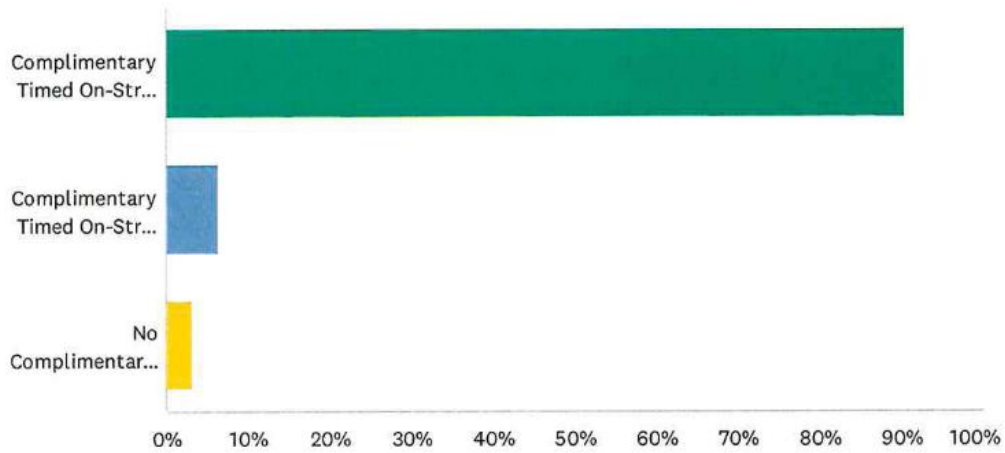
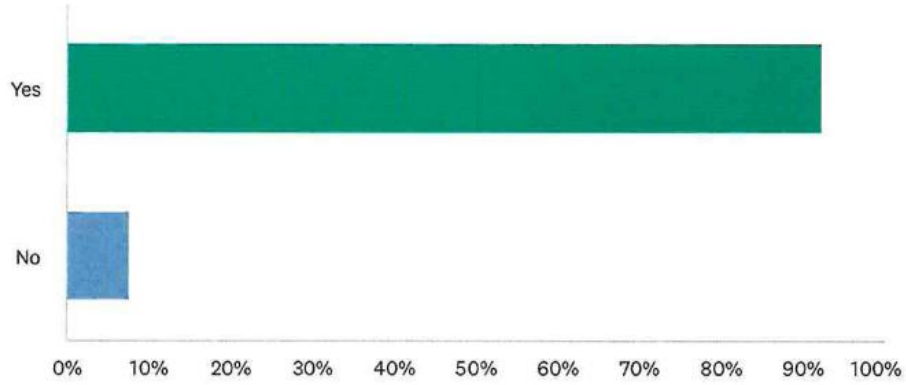| ANSWER CHOICES	RESPONSES	
Complimentary Timed On-Street Parking to continue indefinitely	90.32%	28
Complimentary Timed On-Street Parking for Christmas Period	6.45%	2
No Complimentary Timed On-Street Parking	3.23%	1
TOTAL		31

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Shepparton Chamber of Commerce & Industry CBD Complimentary On-Street Timed Parking
Survey for Shoppers

Q1 Did you visit the CBD more often during the Complimentary On-Street Timed Parking period November through February?

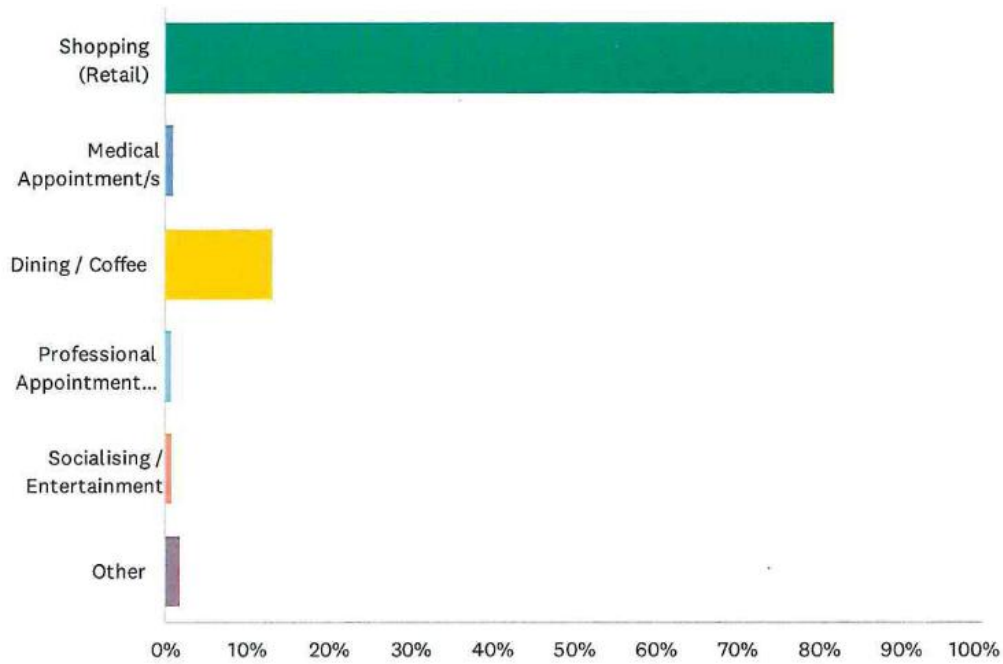Answered: 354   Skipped: 1

ANSWER CHOICES	RESPONSES	
Yes	92.37%	327
No	7.63%	27

Total Respondents: 354

Shepparton Chamber of Commerce & Industry CBD Complimentary On-Street Timed Parking Survey for Shoppers

Q2 Why were you visiting the CBD during this time?

Answered: 355   Skipped: 0

ANSWER CHOICES	RESPONSES	
Shopping (Retail)	81.97%	291
Medical Appointment/s	1.13%	4
Dining / Coffee	13.24%	47
Professional Appointment (Legal / Financial)	0.85%	3
Socialising / Entertainment	0.85%	3
Other	1.97%	7
TOTAL		355

1/1

Shepparton Chamber of Commerce & Industry CBD Complimentary On-Street Timed Parking Survey for Shoppers

Q3 Please rate your satisfaction with the Complimentary On-Street Timed Parking experience in the CBD:

Answered: 355   Skipped: 0
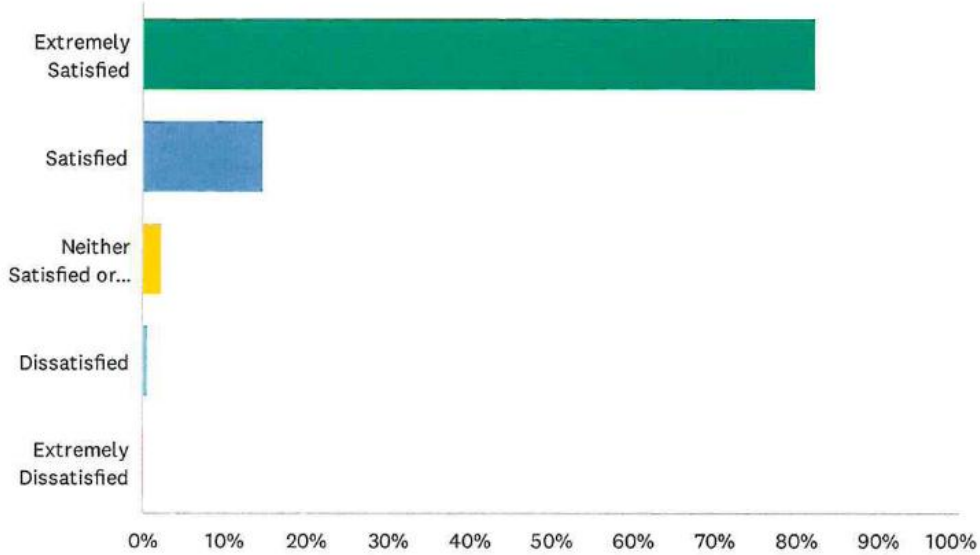
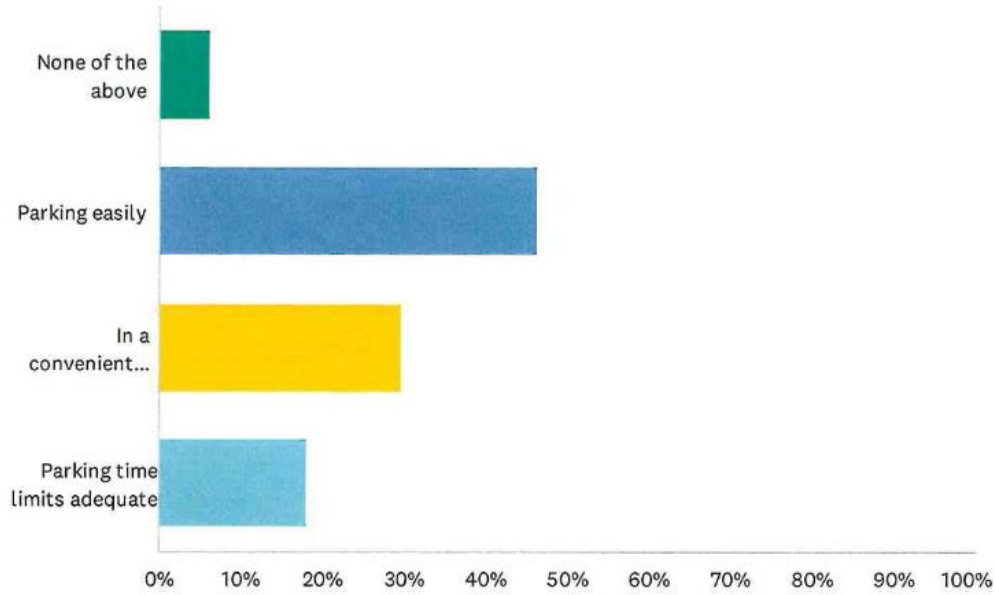| ANSWER CHOICES	RESPONSES	
Extremely Satisfied	82.25%	292
Satisfied	14.65%	52
Neither Satisfied or Dissatisfied	2.25%	8
Dissatisfied	0.56%	2
Extremely Dissatisfied	0.28%	1
TOTAL		355

Shepparton Chamber of Commerce & Industry CBD Complimentary On-Street Timed Parking Survey for Shoppers

Q4 Did you find:

Answered: 355   Skipped: 0

QUIZ STATISTICS

Percent Correct	Average Score	Standard Deviation	Difficulty
100%	5.0/5.0 (100%)	0.00	1/1

ANSWER CHOICES	SCORE	RESPONSES	
✓ None of the above	5/5	6.20%	22
✓ Parking easily	5/5	46.20%	164
✓ In a convenient location	5/5	29.58%	105
✓ Parking time limits adequate	5/5	18.03%	64
TOTAL			355

Shepparton Chamber of Commerce & Industry CBD Complimentary On-Street Timed Parking
Survey for Shoppers

Q5 How far from Shepparton CBD do you live?

Answered: 355   Skipped: 0
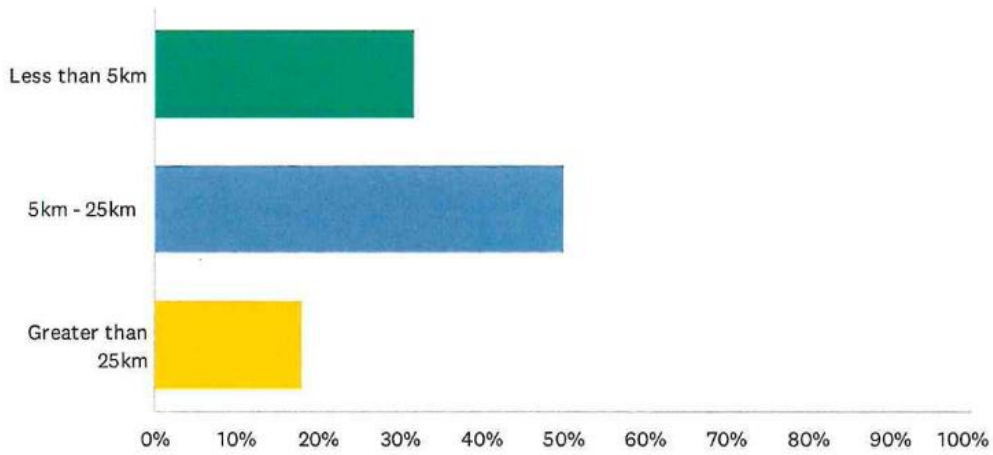
ANSWER CHOICES	RESPONSES	
Less than 5km	31.83%	113
5km - 25km	50.14%	178
Greater than 25km	18.03%	64
TOTAL		**355**

Shepparton Chamber of Commerce & Industry CBD Complimentary On-Street Timed Parking
Survey for Shoppers

Q6 Would you like to see:

Answered: 354   Skipped: 1
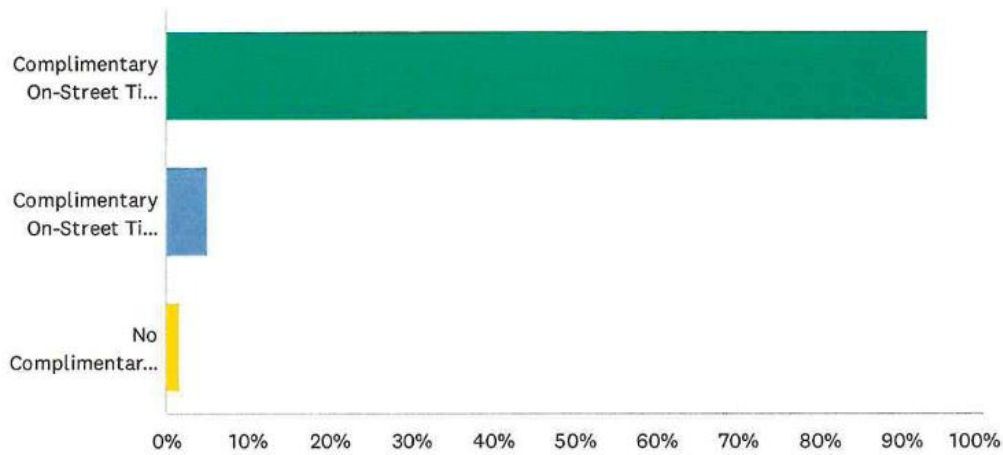
ANSWER CHOICES	RESPONSES	
Complimentary On-Street Timed Parking to continue indefinitely	93.22%	330
Complimentary On-Street Timed Parking for Christmas Period	5.08%	18
No Complimentary On-Street Timed Parking	1.69%	6
TOTAL		354

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