



OD Surveys around Wellington St, Collingwood and Clifton Hill

- ❖ Report
- ❖ October 2023

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1.0 Introduction

On Wednesday 11th and Saturday 14th October 2023, Matrix Traffic Data undertook an origin destination survey around Wellington St, Collingwood, and Clifton Hill.

The survey used video capture techniques to record vehicle number plates for six hours on Wednesday and Saturday respectively:

- 07:00 to 10:00 on Wednesday 11th October 2023
- 15:30 to 18:30 on Wednesday 11th October 2023
- 10:00 to 16:00 on Saturday 14th October 2023

The information was recorded at 12 stations, covering movements in both directions.

Number plate observations were classified into two vehicle classes:

- Light vehicles
- Heavy vehicles.

The analysis of the survey presented here encompasses pairwise matching between all possible combinations of origin and destination stations, except for the matches from any station to itself.

This report provides:

- an outline of data collection in Chapter 2.
- a description of how the data was processed to produce clean records in Chapter 3.
- Chapter 4 provides a description of the reporting outputs from the analysis.

2.0 Data Collection

2.1 Site Location

Vehicle number plates were recorded at 11 two-way stations and 1 one-way station within the study area, and these were processed and analysed for subsequent reporting. The table below describes station locations, their site numbering, and their directions for directional matching.

Table 1: Observation station locations

Station	Direction	Road	Location
1N	Northbound	Wellington Street	South of Queens Parade
1S	Southbound	Wellington Street	South of Queens Parade
2N	Northbound	Wellington Street	North of Alexandra Parade
2S	Southbound	Wellington Street	North of Alexandra Parade
3N	Northbound	Wellington Street	South of Alexandra Parade
3S	Southbound	Wellington Street	South of Alexandra Parade
4N	Northbound	Wellington Street	Between Sackville Street and Johnston Street
4S	Southbound	Wellington Street	Between Sackville Street and Johnston Street
5N	Northbound	Budd Street	Between Alexandra Parade and Mater Street
5S	Southbound	Budd Street	Between Alexandra Parade and Mater Street
6N	Northbound	Gold Street	Between Sackville Street and Johnston Street
6S	Southbound	Gold Street	Between Sackville Street and Johnston Street
7N	Northbound	Gold Street	Between Alexandra Parade and Mater Street
7S	Southbound	Gold Street	Between Alexandra Parade and Mater Street
8N	Northbound	Hoddle Street Service Rd	Between Hotham Street and Hoddle Street
9E	Eastbound	Keele Street	Between Budd Street and Wellington Street
9W	Westbound	Keele Street	Between Budd Street and Wellington Street
10E	Eastbound	Easey Street	Between Budd Street and Wellington Street
10W	Westbound	Easey Street	Between Budd Street and Wellington Street
11E	Eastbound	Hotham Street	Between Budd Street and Wellington Street
11W	Westbound	Hotham Street	Between Budd Street and Wellington Street
12E	Eastbound	Mater Street	Between Budd Street and Wellington Street
12W	Westbound	Mater Street	Between Budd Street and Wellington Street

The observation system is shown on the figures below.

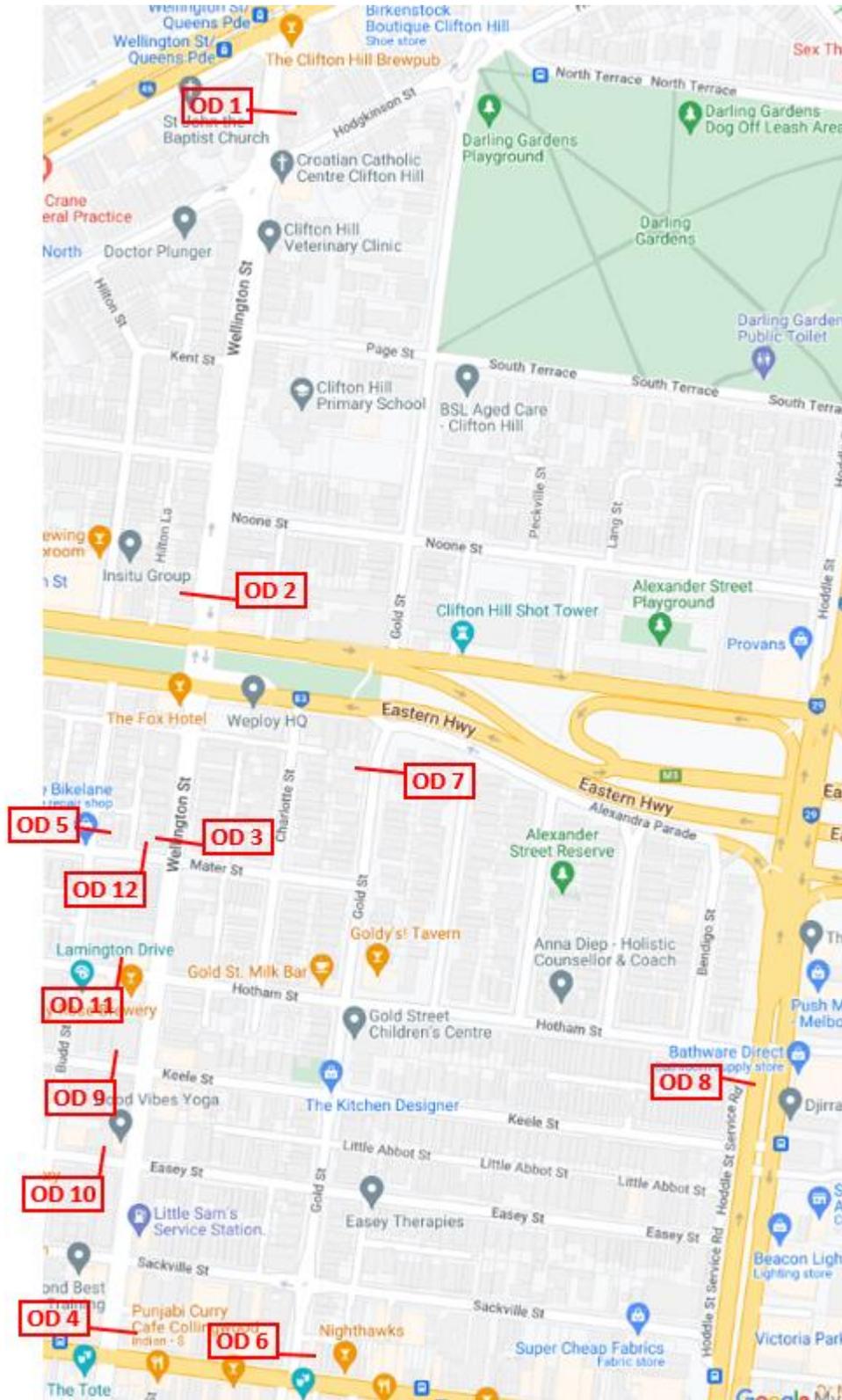


Figure 1 Map of Survey Area

2.2 Observations

Vehicles' number plates were videoed at each of the stations on:

- 07:00 to 10:00 on Wednesday 11th October 2023
- 15:30 to 18:30 on Wednesday 11th October 2023
- 10:00 to 16:00 on Saturday 14th October 2023

Number plate observations were classified into two vehicle classes: light vehicles and heavy vehicles.

All vehicles formed the sample.

These videos were subsequently reduced in a controlled office environment to provide a single file of records comprising the following fields: number plate, vehicle class, time of observation and observation station.

Where a number plate had one or more character positions obscured to the point where it could not be read with certainty, data entry staff were instructed to insert a hyphen ('-') in that position(s).

3.0 Data Processing and Analysis

3.1 General

This chapter describes data processing and analysis applied to identify movements through the study area.

3.2 Data processing

Records of number plate observations were reviewed to identify if the number plate was complete during data processing. If a number plate contained one or more 'hyphens' (i.e., missed number plate character position(s)), it was excluded from further matching analysis, and is accounted for through an expansion process, which is described in Section 3.5 below.

3.3 Travel time distributions

Number plates were matched to identify travel time distributions between logical station pairs. This process assists to: identify possible problems with the data; and to provide a set of minimum and maximum travel time cut-offs for 'trips'¹.

3.4 Matching process

The matching process has been designed to be two stages:

- (1) Exact matches. If two number plates from different station are exactly same, then they are picked up as an exact match.
- (2) Fuzzy matches. A specific fuzzy logic has been introduced into the matching process to pick up matches where 5 digits in a pair of number plates are same while 1 digit is different. For instance, ABC12D and A8C12D will be picked up as a fuzzy match. To limit the probability of false positive, we only match the digit that is different if they are paired in the table below:

¹ Where a trip is considered to be travel between an origin station and a destination station by a reasonably direct route (i.e., the driver is seeking to minimise travel time).

Digit	Alternates
0	[69OCDQU]
1	[7IJLT]
2	[7LZ]
3	[89SE]
4	[AS]
5	[69SEF]
6	[05OS]
7	[12TZ]
8	[39BE]
9	0358OGQ
A	[4DSV]
B	[8CDEPS]
C	[0BDGOL]
D	[ABCO0QU]
E	[358BF]
F	[5EPR]
G	[9CSQ]
H	[MNK]
I	[1JLTY]
J	[11LT]
K	[RNWYH]
L	[12IJNC]
M	[NHWX]
N	[MHKWL]
O	[096CQDU]
P	[BFR]
Q	[90ODG]
R	[FKP]
S	[3456ABG]
T	[17IJ]
U	[0DVYOW]
V	[UWYA]
W	[MNKVU]
X	[MYZ]
Y	[IKVUX]
Z	[27X]

Analysis was undertaken for the whole survey period with reporting by hour.

3.5 Expansion process

Due to a range of factors associated with number plate surveys, some observations are incomplete.

Incomplete number plates

As noted previously, where a character position or positions in a numberplate were not clear to the data recorder, then a hyphen ('-') was inserted. If at least one hyphen was recorded in the number plate field, then it was excluded from further matching analysis. In order to account for this in the results, a process of expansion was applied.

Expansion factors for each station were calculated using the following approach:

$$\text{Expansion factor} = \text{total plates (including those with a '-')} / \text{good plates} \quad [1]$$

This was undertaken by station, vehicle class and by hour.

These expansion factors were applied multiplicatively for the first and last station observed. That is, for an observation I, passing from Station O to Station D, the expansion factor is computed using the following²:

$$\text{ExpFactorObservation I} = \text{Expansion Factor Station O} * \text{Expansion Factor Station D} \quad [2]$$

Where:

- *Expansion Factor Station O is the expansion factor calculated for origin station using [1] above*
- *Expansion Factor Station D is the expansion factor calculated for destination station using [1] above*

² Where secondary stations were included in the matching – along general route alignments – the expansion factors were applied to the first and last stations only, i.e., to the primary stations only.

4.0 Reporting

The following is a list of the reporting for the project in the following workbooks:

- **AUVIC7802 OD Surveys around Wellington St, Collingwood, and Clifton Hill - Wednesday AM - 30Min OD Report.xlsx**
- **AUVIC7802 OD Surveys around Wellington St, Collingwood, and Clifton Hill - Wednesday AM - 30Min TT Report.xlsx**

- **AUVIC7802 OD Surveys around Wellington St, Collingwood, and Clifton Hill - Wednesday PM - 30Min OD Report.xlsx**
- **AUVIC7802 OD Surveys around Wellington St, Collingwood, and Clifton Hill - Wednesday PM - 30Min TT Report.xlsx**

- **AUVIC7802 OD Surveys around Wellington St, Collingwood, and Clifton Hill - Saturday - 30Min OD Report.xlsx**
- **AUVIC7802 OD Surveys around Wellington St, Collingwood, and Clifton Hill – Saturday - 30Min TT Report.xlsx**