

Oxfordshire County Council

Burwell Meadow, Witney ANPR Survey Analysis

2022/2023

Introduction and Background

In 2022, residents living in the Burwell Meadows area of Witney raised concerns with their Local Member regarding the volume of vehicles travelling through the area. They consider Burwell Meadow and Burwell Drive were being used as a 'rat-run' route for through traffic between Thorney Leys and Curbridge Road to avoid any traffic build up at the adjoining junctions.

Officers commissioned an ANPR survey to assess the number of vehicles travelling into, out of and through the Burwell area, and track the trips that were made to ascertain what percentage could be classified as through ('rat running') traffic.

Survey Details

Automatic number plate recognition (ANPR) is technology for automatically reading vehicle number plates. The technology uses cameras with optical character recognition (OCR) to automatically read license plate characters. The ANPR was accompanied with a classified traffic count to verify the camera capture rate.

ANPR data was collected between 19th – 21st July 2022 and collated into 15-minute intervals over a 12-hour period (7am to 7pm). Four locations were surveyed with ANPR, of which one was defined as an "internal site" (see Figure 1). The sites are listed in Table 1. This data was collected during school term time.

*Please note: the third day of surveying was compromised due to the camera at **ANPR Site 1** ceasing to transmit data in the early hours of the morning. Therefore, there is no data at this site location for this particular day.*

Table 1: ANPR Locations

Site #	Date (start)	Location
ANPR 1	Tuesday 19 th July 2022	Burwell Meadow, north of Thorney Leys
ANPR 2	Tuesday 19 th July 2022	Burwell Meadow, south of Burwell Drive
ANPR 3	Tuesday 19 th July 2022	Burwell Drive, south of Curbridge Road
ANPR 4	Tuesday 19 th July 2022	Burwell Drive, west of Ducklington Lane

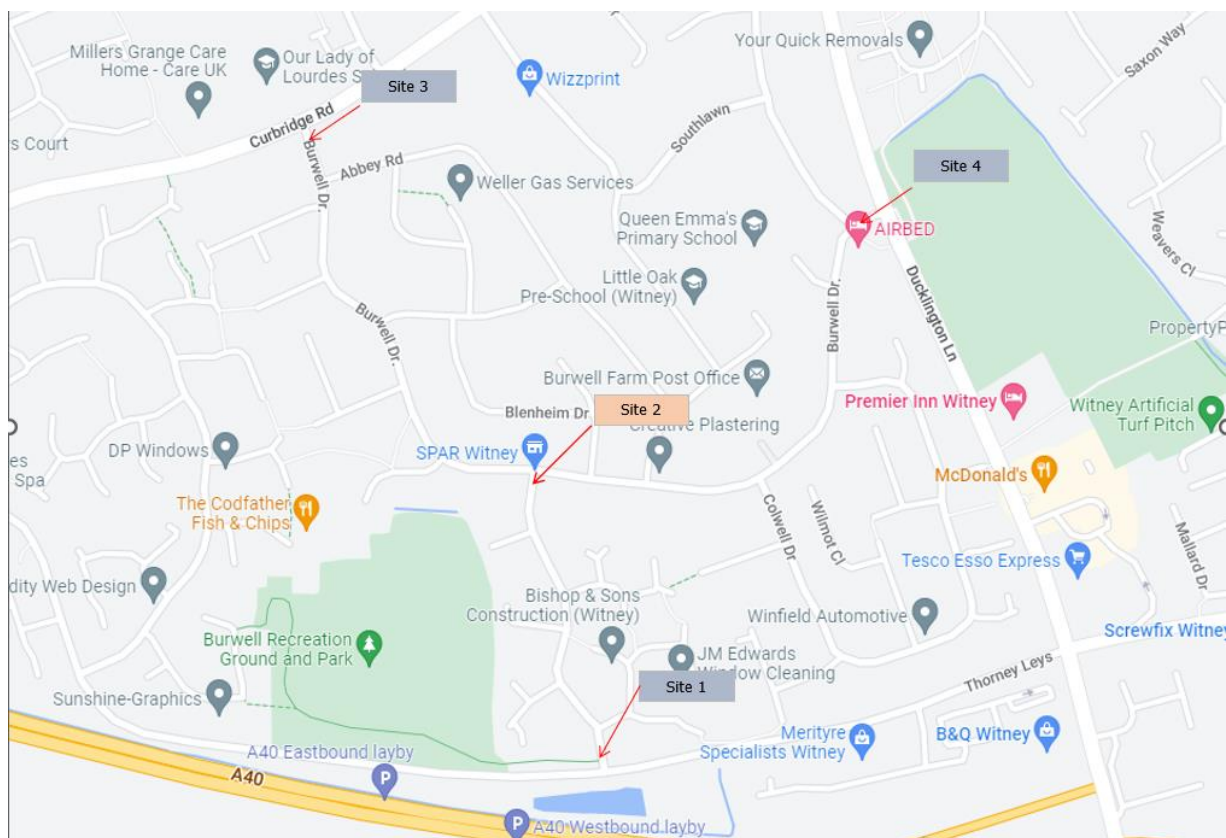


Figure 1: Map showing all ANPR sites.

Classified Traffic Counts

At each ANPR camera location a classified traffic count was also undertaken. Table 2 shows the two-way traffic volume recorded per day from 7am-7pm.

Table 2: Classified traffic count data

Two-way traffic count – number of vehicles	Tuesday 19 th July 2022 7am – 7pm	Wednesday 20 th July 2022 7am – 7pm	Thursday 21 st July 2022 7am – 7pm
ANPR #1 Burwell Meadow, north of Thorney Leys	1190	1353	n/a
ANPR #2 Burwell Meadow, south of Burwell Drive	857	917	909
ANPR #3 Burwell Drive, south of Curbridge Road	1822	1968	1779
ANPR #4 Burwell Drive, west of Ducklington Lane	2429	2643	2392

As indicated in the classified count table above, the most dominant flow of vehicles entering and leaving Burwell Drive is via Ducklington Lane; with an approximate average of 2,488 vehicles travelling two-way from 7am-7pm across the three day surveying period.

Capture Rates

According to the Home Office’s guidance ANPR’s capture rate can be defined as “*the number of Vehicle Registration Marks (VRMs) detected and logged by an ANPR device in comparison with the total number of VRMs passing through the field of view that are visible to a human. This is expressed as a percentage irrespective of whether they are correctly read or not*”.

On this occasion the overall capture rate for the 12-hour survey period was fairly consistent (see Table 3) ranging between 89 - 93%.

Whilst typically capture rates fall within the range of 90 - 99.9% the official National ANPR Standard for Policing (NASP), guidance states “*systems must capture 98% of all VRM that are visible to the human eye and accurately read 95% of captured VRM.*” However, this guidance is based on more permanent installations – temporary installations like those used in this survey can be expected to achieve lower capture rates (>80%) and still be deemed acceptable if not NASP compliant.

See Table 3, below for further details on how each daily collection within this survey performed.

Table 3: Overall daily capture rates of data collection (all sites).

Overall Sample Rates (12 hours)			
Date	Capture Rate	Captured Plates	MCC Count
19/07/2022	89%	6298	5627
20/07/2022	92%	6881	6354
21/07/2022	93%	5080	4735

Analysis – Trip Chaining

ANPR data is primarily used in order to identify how vehicles move through a given network, set out by a series of motion detection cameras which record vehicle registration plates. If the vehicle passes through a series of different cameras within a certain sequence it gives an accurate account of how that vehicle moved through the network.

Percentage of inbound through journeys

Table 4 shows the number of vehicles the ANPR cameras matched between an origin camera and a destination camera with a short journey time of less than 5 minutes. The matched traffic volume is displayed as a percentage of total recorded traffic at the point of origin.

For example, on 19th July 34 vehicles were matched entering at camera 1 at Burwell Meadow and exiting at camera 3 Burwell Drive at the junction with Curbridge Road; 595 vehicles were recorded as entering Burwell Meadow, so the percentage of traffic entering at Burwell Meadow and undertaking the movement to Curbridge Road via Burwell Drive in less than 5 minutes is 6%.

Table 5 shows the number of vehicles the ANPR cameras matched between an origin camera and a destination camera with a short journey time of less than 5 minutes. The matched traffic volume is displayed as a percentage of total recorded traffic at the destination/exit point.

For example, on 20th July 34 vehicles were matched entering at camera 1 at Burwell Meadow and exiting at camera 3 Burwell Drive at the junction with Curbridge Road; 702 vehicles were recorded as exiting Burwell Drive, so the percentage of traffic exiting at Burwell Drive and undertaking the movement from Burwell Meadow via Burwell Drive in less than 5 minutes is 5%.

Figures 2 and 3 show the journey routing.

Conclusion

The route of Burwell Drive between Curbridge Road and Ducklington Lane saw the highest percentage of through (rat-running) journeys during the three-day surveying period, particularly between ANPR 4 Burwell Drive (Ducklington Lane) to ANPR 3 Burwell Drive (Curbridge Road) ranging from 7% to 11%. Through traffic involving Burwell Meadow was much lower between 1-6%.

Table 4: Percentage of inbound through journeys

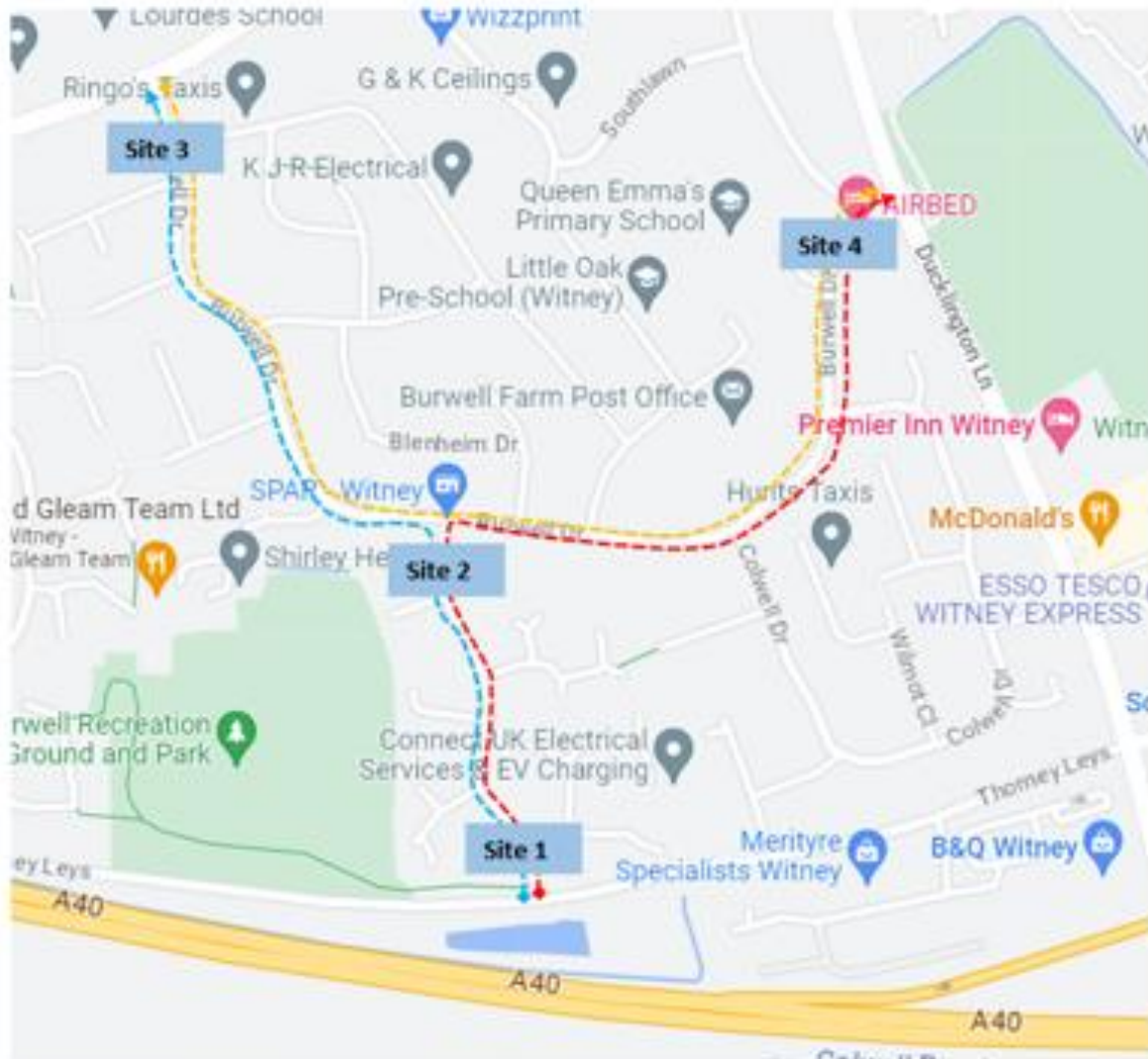
Route	All Vehicles		19th July			20th July			21st July		
	Origin	Destination	Journeys 5 minutes or under	Traffic Count at Origin (inbound only)	The through journeys as a % of traffic entering at Origin	Journeys 5 minutes or under	Traffic Count at Origin (inbound only)	The through journeys as a % of traffic entering at Origin	Journeys 5 minutes or under	Traffic Count at Origin (inbound only)	The through journeys as a % of traffic entering at Origin
1	ANPR 1: Burwell Meadow (Thorney Leys)	ANPR 3: Burwell Drive (Curbridge Road)	34	595	6%	34	651	5%	n/a	606	n/a
2	ANPR 1: Burwell Meadow (Thorney Leys)	ANPR 4: Burwell Drive (Ducklington Lane)	7	595	1%	8	651	1%	n/a	606	n/a
3	ANPR 3: Burwell Drive (Curbridge Road)	ANPR 4: Burwell Drive (Ducklington Lane)	81	874	9%	92	963	10%	77	847	9%
4	ANPR 4: Burwell Drive (Ducklington Lane)	ANPR 3: Burwell Drive (Curbridge Road)	123	1293	10%	109	1368	8%	91	1248	7%
5	ANPR 3: Burwell Drive (Curbridge Road)	ANPR 1: Burwell Meadow (Thorney Leys)	29	874	3%	48	963	5%	n/a	847	n/a
6	ANPR 4: Burwell Drive (Ducklington Lane)	ANPR 1: Burwell Meadow (Thorney Leys)	9	1293	1%	9	1368	1%	n/a	1248	n/a

Percentage of outbound through journeys

Table 5: Percentage of outbound through journeys

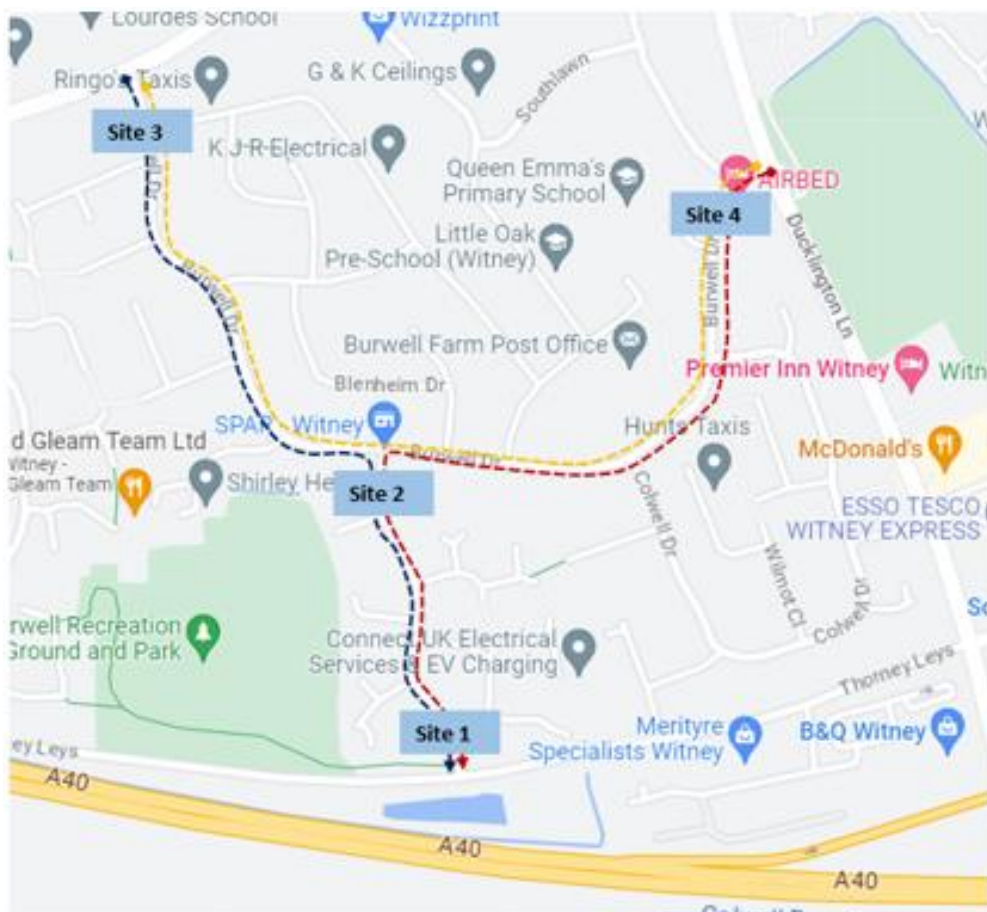
Route	All Vehicles Origin	Destination	19th July			20th July			21st July		
			Journeys 5 minutes or under	Traffic Count at Destination (Outbound only)	The through journeys as a % of traffic exiting at Destination	Journeys 5 minutes or under	Traffic Count at Destination (Outbound only)	The through journeys as a % of traffic exiting at Destination	Journeys 5 minutes or under	Traffic Count at Destination (Outbound only)	The through journeys as a % of traffic exiting at Destination
1	ANPR 1: Burwell Meadow (Thorney Leys)	ANPR 3: Burwell Drive (Curbridge Road)	34	595	6%	34	702	5%	n/a	623	n/a
2	ANPR 1: Burwell Meadow (Thorney Leys)	ANPR 4: Burwell Drive (Ducklington Lane)	7	595	1%	8	702	1%	n/a	623	n/a
3	ANPR 3: Burwell Drive (Curbridge Road)	ANPR 4: Burwell Drive (Ducklington Lane)	81	948	9%	92	1005	9%	77	932	8%
4	ANPR 4: Burwell Drive (Ducklington Lane)	ANPR 3: Burwell Drive (Curbridge Road)	123	1136	11%	109	1275	9%	91	1144	8%
5	ANPR 3: Burwell Drive (Curbridge Road)	ANPR 1: Burwell Meadow (Thorney Leys)	29	948	3%	48	1005	5%	n/a	932	n/a
6	ANPR 4: Burwell Drive (Ducklington Lane)	ANPR 1: Burwell Meadow (Thorney Leys)	9	1136	1%	9	1275	1%	n/a	1144	n/a




Figure 2: Map showing journey routes through Burwell, routes 1, 2 and 3.



1	ANPR 1: Thorney Leys / Burwell Meadow	ANPR 3: Curbridge Road / Burwell Drive	
2	ANPR 1: Thorney Leys / Burwell Meadow	ANPR 4: Ducklington Lane / Burwell Drive	
3	ANPR 3: Curbridge Road / Burwell Drive	ANPR 4: Ducklington Lane / Burwell Drive	

Figure 3: Map showing journey routes through Burwell, routes 4, 5 and 6



4	ANPR 4: Ducklington Lane / Burwell Drive	ANPR 3: Curbridge Road / Burwell Drive	
5	ANPR 3: Curbridge Road / Burwell Drive	ANPR 1: Thorney Leys / Burwell Meadow	
6	ANPR 4: Ducklington Lane / Burwell Drive	ANPR 1: Thorney Leys / Burwell Meadow	

Additional Analysis

Further analysis has been requested by residents of Burwell Meadow. The initial analysis looked at the Burwell area as a whole neighbourhood and sought to identify if there was a high proportion of through / rat running traffic from the boundary roads of Thorney Leys, Curbridge Road and Ducklington Lane. The further analysis seeks to identify if the traffic on Burwell Meadow originates /destined for Burwell Meadow or the wider Burwell neighbourhood.

Table 6 shows the number of vehicles the ANPR cameras matched between ANPR camera 1 at the southern end of Burwell Meadow and ANPR camera 2 location at the northern end of Burwell Meadow, with a short journey time of less than 5 minutes. The matched traffic volume is displayed as a percentage of total recorded traffic at the point of origin. Shown as points A and B on figure 4.

For example, on 19th July 158 vehicles were matched entering at camera 1 at Burwell Meadow and exiting at camera 2 at the northern end of Burwell Meadow; 595 vehicles were recorded as entering Burwell Meadow, so the percentage of traffic entering at Burwell Meadow and undertaking the movement to camera 2 in less than 5 minutes is 27%. On 20th July this figure was 36%.

Table 7 shows the number of vehicles the ANPR cameras matched between ANPR camera 1 at the southern end of Burwell Meadow and ANPR camera 2 location at the northern end of Burwell Meadow, with a short journey time of less than 5 minutes. The matched traffic volume is displayed as a percentage of total recorded traffic at the destination/exit point. Shown as points C and D on figure 4.

For example, on 19th July 158 vehicles were matched entering at camera 1 at Burwell Meadow and exiting at camera 2 at the northern end of Burwell Meadow; 422 vehicles were recorded as exiting Burwell Meadow, so the percentage of traffic exiting at Burwell Meadow north having undertook the movement from Burwell Meadow south in less than 5 minutes is 37%. On the 20th July this figure was 48%.

Additional Analysis Conclusion

The data shows that between 20% and 48% of the traffic on Burwell Meadow is using the route as a through route. The low level of traffic routing onward to the boundary roads (Thorney Leys, Curbridge Road and Ducklington Lane) indicate a high proportion of this traffic is generated by the Burwell neighbourhood (e.g., Burwell Drive and its side roads). The data also indicates that 50% (or more) of the traffic on Burwell Meadow is generated by Burwell Meadow.

Figure 4: Location of ANPR Camera 1 and 2 and traffic count points



Table 6: Percentage of inbound through journeys at Burwell Meadow only

Traffic Count Point	All Vehicles			19th July			20th July		
	Origin	Destination		Journeys 5 minutes or under	Traffic Count at Origin (inbound only)	The through journeys as a % of traffic exiting at Destination	Journeys 5 minutes or under	Traffic Count at Origin (inbound only)	The through journeys as a % of traffic exiting at Destination
A	ANPR 1: Burwell Meadow (Thorney Leys)	ANPR 2: Burwell Meadow (Burwell Drive)		158	595	27%	218	602	36%
B	ANPR 2: Burwell Meadow (Burwell Drive)	ANPR 1: Burwell Meadow (Thorney Leys)		121	435	28%	208	464	45%

Table 7: Percentage of outbound through journeys at Burwell Meadow Only

	All Vehicles			19th July			20th July		
	Origin	Destination		Journeys 5 minutes or under	Traffic Count at Destination (Outbound only)	The through journeys as a % of traffic exiting at	Journeys 5 minutes or under	Traffic Count at Destination (Outbound only)	The through journeys as a % of traffic exiting at Destination
C	ANPR 1: Burwell Meadow (Thorney Leys)	ANPR 2: Burwell Meadow (Burwell Drive)		158	422	37%	218	453	48%
D	ANPR 2: Burwell Meadow (Burwell Drive)	ANPR 1: Burwell Meadow (Thorney Leys)		121	595	20%	208	702	30%