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Torbay Council

Unmet taxi demand survey – Additional Clarifications

October 2024

Introduction

In early August 2024, Torbay Council contacted us seeking further elucidation regarding the suggestion of adding 20 further plates to the current Torbay Council hackney carriage fleet. The decision from the committee advised "Members wished to first explore managed growth, as set out as being an option within the LVSA report, though preferred the suggestion of a 10% increase, as put forward at the hearing by the trade representative". This report seeks to answer if the extra 20 plates will resolve the unmet demand, as the Councillors and trade wish to fix the issue to remove unmet demand.

During the consideration of our 2023 Report further questions had been asked by members of the Regulatory Committee:
- How is the peak factor decided?
- Apparent Torquay discrepancy p80 1.73; p81 1.37 and p57 0.85
- Is the result skewed towards the night-time economy needs?
- Is the result skewed due to the restricted Paignton situation?
- Is the increase of the proportion of travellers travelling in hours greater than a minute from 18.2 to 47.58 derived mainly from results from Paignton and night-time demand? Give p57 and 0.85 average for Torquay (i.e. less than a minute) maybe the solutions are different from the number of drivers?

Brief responses to these questions are provided below. More comprehensive responses are provided in full, later in the document.

- *How is the peak factor decided?*

The peak factor is used to moderate the calculation of the index of unmet demand. Where there is a relatively brief period during the week when demand is significantly higher than other times of the week, then it is deemed unreasonable and unviable to seek to provide sufficient capacity to meet this demand, as this would result in significant over capacity for the remainder of the week. The levels of demand for a few hours on Saturday night is orders of magnitude higher than the average demand through the week. Therefore it is deemed to be peaked. There is a level of professional judgement involved in determining whether demand is peaked. There is no hard and fast arithmetic calculation to derive a threshold value to determine peaked or not peaked.

- *Apparent Torquay discrepancy p80 1.73; p81 1.37 and p57 0.85*

Corrections were identified and applied to correct the discrepancies.

- *Is the result skewed towards the night-time economy needs?*

The methodology to calculate the index value used to identify the level of unmet demand, places more weight on daytime levels of demand and hackney carriage availability than at night. This weighting is applied, in part, as acknowledgement that demand associated with the night time economy tends to be higher than at other times, in many locations. Hence, it could be considered that the result is not skewed towards the night time economy, insofar as it does not consider the levels of demand at night to be the primary driver of the need for improved levels of service.

- *Is the result skewed due to the restricted Paignton situation?*

When the calculation of the index of significant unmet demand is undertaken for all data and for data excluding that collected at Paignton, there is a difference in the result. However, considering the result either with or without Paignton, the conclusions are similar, in that the level of unmet demand is above the threshold which is considered significant. Therefore we would not necessarily agree that the Paignton situation 'skews' the result. However, this clearly has an influence.

- *Is the increase of the proportion of travellers travelling in hours greater than a minute from 18.2 to 47.58 derived mainly from results from Paignton and night-time demand? Give p57 and 0.85 average for Torquay (i.e. less than a minute) maybe the solutions are different from the number of drivers?*

The proportion of travellers travelling in hours when the average delay is greater than a minute is heavily influenced by Paignton. However, there is an overall increase, which is also generally reflected in other locations.

Detailed Response

During discussions it was agreed to undertake further modelling to identify firmer value for the extra fleet numbers required. It was also agreed to cover the issue of 'typical' dates for surveys and if the change of dates of surveys might have impacted the results.

This report covers each questions specifically and then discusses further the modelling and parameters of the unmet demand to help provide confidence in the proposed route chosen moving forward. The results will be presented to a committee meeting in October 2024 to allow further discussion to occur if necessary.

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Definitions

Any reference to the 2023 Report quote page numbers from the report top right corner, and not those added by the committee bundle system (lower bottom middle of page).

Strict unmet demand is when a potential passenger arrives at a rank and finds no vehicle waiting to take them immediately. This can then lead to a queue of passengers building up, still waiting whilst vehicles arrive and depart. However, the case of where people wait when vehicles are always there but people always wait for vehicles to move up, geometric delay, is excluded as the delay is not due to shortage of vehicles.

The term 'unmet demand' is now more widely used to reference matters such as people not being able to obtain specific licensed vehicle service when they need it, such as no wheelchair accessible vehicle, or even simply no suitable vehicle.

The term 'significant unmet demand' is a very specific term related to if, when the index of significance of unmet demand (ISUD) is calculated, its resulting value is 80 or greater. The requirement of licensing authorities is that once that threshold is breached and publicised they cannot then refuse to issue new hackney carriage licences. However, our view is that if an authority is considering its response to the existence of unmet demand then issuing licences whilst the consideration is under way would be inappropriate.

This is because the way demand and supply are met, resulting in the ISUD statistic, is very complex. Over-reaction and supply of too many plates can have the reverse effect if this leads to supply becoming uneconomic. What is difficult – effectively impossible – is to remove a plate once it has been issued. This means the authority needs to be certain of its actions, hence the method of 'managed growth' whereby the actual impact of numbers of plates issued can be evaluated and policy modified as necessary. This may not be a fast process.

The aim of issuing more plates is to provide a measurable and appreciable improvement of service to the public. The aim is not to eliminate unmet demand altogether, which is not easy nor desirable, but to take the ISUD value downwards and preferably below the threshold value of 80. However, for the myriad of reasons explained within the context of our discussion below, the only way to actually know the impact of extra plates is a further test of rank performance.

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Peak Factor

The peak factor is one of the parameters of the 'ISUD' (Index of significance of unmet demand) equation derived by the University of Leeds not long after the enactment of the 1985 Transport Act Section 16. It is one of two parameters that act as fixed values determined by the situation pertaining at the time of the survey being undertaken.

The peakiness factor is generally either 1 (level demand generally) or 0.5 (demand has a high peak at one point during the week). As the 'Index of Significance of unmet demand' (ISUD) tool was developed in its early years, case law provided dispensation for the effects of peaked demand on the ability of the trade to meet that demand to be allowed. This is used to allow for the difficulty of any transport system being able to meet high levels of peaking.

It is rarely possible or practicable for example for any public transport system, or any road capacity, to be provided to cover a few hours a week. The 0.5 value is generally when demand at night, usually at weekends, is substantially higher than demand at other times.

This means that the equation impact is deflated if peaky situations occur, in fact overall results are halved. This plays down the impact of the night demand and therefore expectations of the trade.

The graph below, Figure 1, shows total hourly passenger flows across all ranks in the area during the period surveyed, and also covers the last three surveys. All three days show a similar pattern with reduced flows around 18:00 and 19:00 each day after which there were peaks growing in size from Friday to Saturday (no peak on Thursday in evening this survey as there was in 2020). Daytime flows still appeared similar on all three days. There were three other hours Friday morning (two in 2020) but just one hour on Saturday (two in 2020) that saw no passengers at any rank, otherwise there were people using ranks somewhere in the area in all observed hours, even on Sunday mornings.
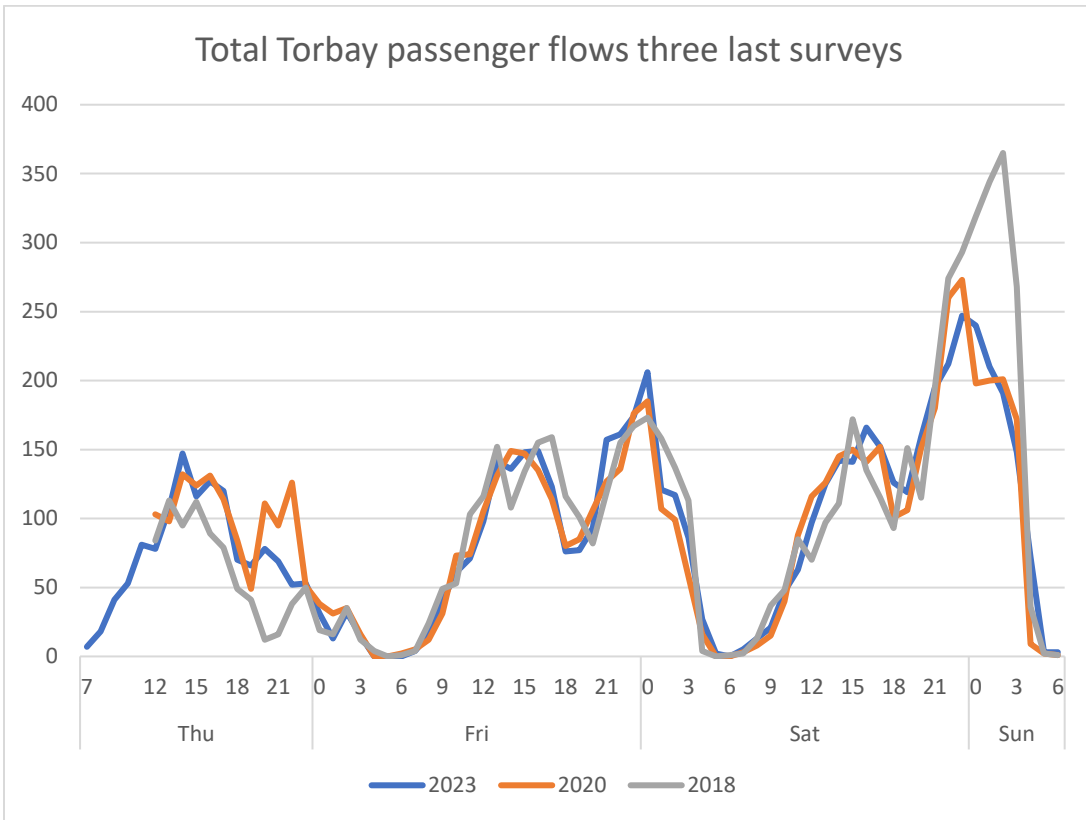
Figure 1 – passenger flows for last three surveys (all observed information)

Average passenger flows in 2023 were 91 (94, 2020, 98, 2018) per hour. (from p26 of 2023 Report). However, the peak to average ratio has continued to reduce, from 3.7 2018 to 2.9 2020 to 2.7 now. The peak was in the same 23:00 Saturday hour as in 2020, which was in the 02:00 hour in 2018. Though the peak in 2023 was again lower, there is evidence that there is a little more early Sunday morning activity, but nowhere near the levels seen in 2018. This suggests that the patterns of usage in 2020 and 2023 are relatively similar, with the hoped-for recovery not yet really observed to any significance. It also demonstrates that the area has a peaky demand profile, which it has retained.

As stated above, although the peak to average ratio has fallen from 3.7 in 2018 to 2.7 now, we consider this remains a peaky profile – as confirmed by the graphs also – so this is why this element is counted as valid. Were this not to apply, the results quoted would all double, making them even more significant.

Value Discrepancies

Tables 1 and 2 below present those from our Report from our pages 50 and 51. The first table compares values from all surveys as available for the full set of survey data in each case, but with two columns for the latest three surveys. 'All' covers all ranks. "Council only" excludes any with supplementary permits, basically the Paignton station rank.

Component	2023		2020		2018		2014	2011	2008
	All	Council only	All	Council only	All	Council only			
Average passenger delay (APD)(mins)	1.73	1.37	0.62	0.48	0.27	0.13	0.7	0.16	0.47
Off peak hours with any delay	43.33	39.77	35.09	31.4	30.59	30.88	8	0	7.2
Proportion of passengers travelling in hours with over a minute APD	47.58	42.24	18.2	16.63	5.40	5.278	5.7	1.42	15.71
Seasonal factor	1	1	1	1	1	1	1	1	1
Peak factor	0.5	0.5	0.5	0.5	1	1	1	0.5	1
Latent Demand factor	1.008	1.008	1.01	1.01	1.047	1.033	1.101	1.126	1
Index of significance of unmet demand (ISUD)	1801.26	1157.17	198.89	127.4	46.72	22.39	35.15	Zero	53.16

Table 1 – Full study area ISUD results, 2008 to 2023

Given that our observations confirmed, as in the last survey, that the area tends to operate almost as three separate areas, and that there are also two ranks with further restricted vehicle numbers arising from the station permit system, further tests were undertaken to compare performance of the fleet divided up into the respective operating regimes. The table below presents the results from these tests. (note the value of 1.37 above for all council only ranks and that similar value below for Torquay ranks in 2023 are coincidentally the same and actually for different situations). This is presented below in the Table 2:

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Component	Torquay		Paignton		Torquay Station		Brixham	
	2023	2020	2023	2020	2023	2020	2023	2020
Average passenger delay (APD)(mins)	1.37	0.3	3.63	0.93	3.38	3.32	1.32	1.62
Off peak hours with any delay	34.72	27.78	75	53.85	31.25	35.71	62.5	50
Proportion of passengers travelling in hours with over a minute APD	43.11	10.98	74.83	22.78	65.43	45.52	38.01	51.23
Seasonal factor	1	1	1	1	1	1	1	1
Peak factor	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Latent Demand factor	1.008	1.008/1.01	1.008/1	1.008/1	1.008/1	1.008/1	1.008/1	1.008/1.06
Index of significance of unmet demand (ISUD)	1031.12	45.74	10195.3	572.48	3486.71	2698.83	1563.89	2194.9

Table 2 – ISUD detailed results for 2023 study, by area of Torbay

It should be reiterated that the fact that the Torquay council ranks in 2023 have the same average passenger delay value as the overall value for all council ranks across the area is coincidental. The 1.73 and 1.37 measure two different sets of average passenger delay – the 1.73 is for all ranks across the area; the second table value is for just the council-operated Torquay ranks (excludes Torquay station but includes The Strand, Post Office Roundabout, Victoria Parade and Union Street).

The last and last but one paragraphs on our page 27, are incorrect and should be replaced by the following tables, developed to provide more detail pertinent to this discussion (the value of 0.85 and the 37 seconds are therefore not relevant, it should also be noted that 37 seconds is 0.62 minutes and the derivation of the 0.85 is not known):

For clarity, the erroneous and corrected two paragraphs (which arose because we neglected to delete pages that were superseded as our procedure is to edit new reports from the previous to ensure comparability, minimise cost and reduce omissions) are:

"In terms of the overall average passenger delay across the surveyed hours, for all ranks, this is 1.73 minutes (37 seconds, 0.62 minutes) per person shared out over all those using hackney carriages. However, when applied just to those that actually had to wait, the typical wait was 5 minutes and 36 seconds (4 minutes 24 seconds, 2020). 78% of those waiting waited between one and five minutes, 15% six to 10 minutes and 7% 11 minutes or more.

However, the pattern across the area varies. Over the full days observed, Torquay Station saw the worst average passenger delays – 1 minute 26 seconds (over four minutes, 2020) on the Thursday, 3 mins 23 seconds (just under six minutes, 2020) on the Friday and 4 minutes 53 seconds (56 seconds, 2020) on the Saturday. Brixham had 55 seconds (1m51), 1 m 10 (1m11) and 1m 44 (1m 54) respectively. Paignton Station saw 2m12 (1m17), 4 mins =(34 seconds) and 4m12 (1m 4) respectively. All other ranks, all in Torquay, had average passenger delays over each day of up to 3m2 seconds (no more than 51 seconds, with many less than that (e.g. Union Street, Saturday, just one second), 2020)."

Tables 3 and 4 below present the average passenger delay (APD) and the passenger delay only for those who experienced a delay for each of the areas and for each rank within the Torquay set of ranks, for 2023 and 2020 surveys to show how patterns of delay have changed. The latter statistic is important as it would be what those who waited actually experienced, colouring their views more than that for those that did not wait. ISUD works on the delay shared out over ALL passengers, not just those experiencing a delay, which is counted to be a fairer evaluation, given that the ISUD tool is testing the overall impact on the service to all passengers, not just the smaller number that actually experience waiting.

Location	Total		Paignton		Torquay Station		Brixham	
	2023	2020	2023	2020	2023	2020	2023	2020
Average Passenger Delay (APD)								
For all areas – 2023 1:44 2020 0:37								
Thursday			2:12	1:17	1:26	4:03	0:55	1:51
Friday			4:00	0:34	3:23	5:59	1:10	1:11
Saturday			4:12	1:04	4:53	0:56	1:44	1:54
Average delay, only those experiencing delay:								
For all areas – 2023 5:36 2020 4:24								
Thursday			7:46	6:59	11:59	10:37	4:25	5:54
Friday			7:58	3:51	9:02	13:22	6:11	4:49
Saturday			10:20	4:55	8:14	6:09	6:06	5:27
All hours	5:36	4:24						

Table 3 – Average passenger delay (APD) and average delay 2023

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Table 3 and 4 values highlighted in yellow present 2023 values in excess of those in 2020. Green highlighted values are those less than 2020, with the main improvement observed for Brixham rank. Table 3 shows that all APD and values for those experiencing a delay have increased on all days in the Paignton observations. Both Torquay station and Brixham have generally seen improvement, more so on the Thursday, although the station situation in Torquay on the Saturday has worsened.

Table 4 below then presents all Torquay council ranks and also drills down into further detail for the Torquay ranks by rank:

Location	All council, Torquay		Strand		Union St		P O Rbt		Cary Parade		Victoria Parade	
	2023	2020	2023	2020	2023	2020	2023	2020	2023	2020	2023	2020
Average Passenger Delay (APD)												
Thursday	0:46	0:29	1:07	0:31	0:20	0:04	1:00	0:51			0:35	0:28
Friday	0:58	0:11	1:10	0:10	0:11	0:16	0:44	0:23	0:29	0:02	2:47	0:06
Saturday	1:52	0:19	1:51	0:22	0:43	0:01	2:59	0:20	3:02	0:05	0:00	0:17
Only those experiencing a delay:												
Thursday	4:40	4:01	5:29	3:27	3:23	9:02	7:00	8:58			3:23	3:52
Friday	4:51	3:26	4:49	2:52	3:51	4:49	3:51	5:04	3:17	3:00	15:20	3:19
Saturday	4:20	2:36	3:55	2:32	3:23	1:10	12:02	7:38	7:39	1:15	0:00	2:35

Table 4 – APD and average delay by each Torquay rank individually

For the Torquay ranks almost all days and locations have seen worsened levels of delay. The change on the Saturday at Victoria Parade reflects its lack of use on that day.

68% (78% in 2020) of those waiting waited between one and five minutes, 21% (15%) six to 10 minutes and 12% (7%) 11 minutes or more. This suggests waiting times have generally increased.

In terms of total time waited by passengers, in 2023 43% of all delay hours were at the Strand (was 13% 2020), with the Saturday seeing 28% alone; Paignton saw 32% (was 37%), Brixham 11% (13%), Post Office Roundabout 5% (8%), Cary Parade 4% (7%), Torquay Station 2% (9%), Union Street 2% (3%) and Victoria Parade 1% (2%). These suggest the main issue for this survey is the level of service and queueing at The Strand rank although all locations remain at poorer levels of service than the index suggests is healthy.

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Skewing of results (night time and / or Paignton)
The tables above and the overall application of the index (with the peak factor in action dampening the overall ISUD result) reduce any skew to night time results, and the consideration by area also removes any impact of Paignton. Further discussion below considers the overall fit of each location within the mix.

The total waiting hours were reviewed for all locations. The Strand accounted for 43% of all waiting hours, Paignton 32% and Brixham 11%, some 86% between these three locations. The other ranks accounted for 5% or less (each) of the total. Hence it is The Strand that is contributing most, with Paignton second in magnitude but contributing just under a third of total hours of delay.

Impact of Paignton and night-time on travellers in hours with average passenger delay greater than a minute
The number of hours with passenger delay over a minute and under by rank are shown in Table 5 below, listed in descending order of proportion of the total of hours with APD one minute or more:

Rank	APD 1 minute +	APD less than 1 min	% of total
Paignton Station	37	9	33
The Strand	20	22	18
Brixham	17	15	15
PO Roundabout	10	11	9
Cary Parade	9	3	8
Torquay Station	9	1	8
Union St	5	9	5
Victoria Parade	4	2	4

Table 5 – hours with average passenger delay over a minute and under by rank

This does show that Paignton Station is the location with a third of the hours with a minute or more average passenger delay, with The Strand having 18%. However, as already noted, the value of ISUD being used to define that the area overall has significant unmet demand is the value for all Council ranks only, excluding Paignton and Torquay station observations.

With respect to night-time impacts, as already noted, use of the peak factor of 0.5 deflates the impact although Table 6 below shows that these hours (for the full survey area) do inevitably still impact the overall performance.

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Period	APD 1 minute +	APD less than 1 min	% of total (APD+1 min)
Thurs 07:00-21:59	22	16	23
Thurs 22:00-06:59	6	2	6
Fri 07:00-21:59	21	23	22
Fri 22:00-06:59	14	5	15
Sat 07:00-21:59	13	8	14
Sat 22:00-06:59	18	0	19
Total	94	54	148
%	64%	36%	

Table 6 – hours with APD a minute or more by period

This shows that the largest proportion of hours with delay over a minute is actually the daytime hours on Thursday (23%) then the same hours on the Friday (22%). The proportion of hours with delay over a minute increases for the overnight period from Thursday to the weekend as might be expected (6% to 15% to 19%).

This table, however, confirms the widespread nature of the unmet demand. Our typical understanding of this kind of spread is the impact that lower flows at ranks often mean hackney carriages need to find other demand to ensure their ability to make ends meet, which implies contracts or alliance to private hire circuits, or use of booking circuits (or more recently apps), which reduces their activity at ranks, and therefore increases passenger delay at ranks.

Passengers walking away.
A further review was undertaken of the data available from the 2023 survey to identify the levels of change.

The rank surveys do record passengers walking away from ranks. There can be many reasons for this, some legitimate such as groups of friends having seen part of their group safely into a licensed vehicle leaving as they themselves are travelling home another way, people leaving the rank queue having joined it whilst also making a booking, and leaving because their booked vehicle has arrived, or just deciding to travel a different way. Others will be 'giving up' waiting.

The total numbers observed leaving ranks in 2020 and 2023 are shown below in Table 6.

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Rank	2020	2023	% increase
Paignton Station	22	75	241
The Strand	58	143	147
Brixham	11	29	164
PO Roundabout	2	8	300
Cary Parade	5	5	0
Torquay Station			
Union St	10	14	40
Victoria Parade			

Table 6 – walk aways

These figures confirm again that the situation between 2020 and 2023 has generally worsened.

Issues of typical dates for surveys

The seasonality factor allows for the undertaking of rank survey work in periods which are not typical, although guidance is that such periods should normally be avoided if possible particularly as the impact of seasons may not just be on the level of passenger demand, but may also impact on the level of supply. This is particularly true in regard to if surveys are undertaken when schools are active or not.

Periods when schools are not active can lead to more hackney carriage vehicles being available whilst they are not required for school contract work. Such periods can also reduce hackney carriage demand with people away on holiday from the area. Generally, use of hackney carriages is higher in December in the run-up to Christmas, but much lower in January, February and the parts of July and August when more people are likely to be on holiday. The factor tends to range from 0.8 for December (factoring high demand level impacts down) to 1.2 for January / February (inflating the values from low demand levels upwards).

There can be special cases where summer demand needs to be covered, although high peaks for tourist traffic use of hackney carriages tend not to be so dominant at the current time, apart from in a few key tourist authorities.

It is accepted that each survey is essentially a snapshot which is determined by a massive range of varying parameters, even down to factors rarely mentioned such as weather at the time of survey. We prefer where possible to undertake surveys at the same time of year, in the same month, although some authorities vary the month in order to better test the robustness of any results.

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It is also the point that the decision is primarily if unmet demand is significant or not, not with reference to the exact level of this, but once the first decision is made there is then value comparing and contrasting over years and locations to understand where the issues overall are.

The 2023 survey was undertaken in June. 2020 was undertaken in early September, with a partial test in October, 2018 was May, 2014 was October, 2011 May and 2008 November (but with some other months added, under a different sample regime).

The original plan for the 2023 survey was to undertake the surveys in May but procurement delays led to the rank survey work being undertaken in June. This was agreed to be a better option than further delaying the survey to the September of 2023. Ironically, we understand that had we delayed to September the surveys would have been strongly impacted by the significant road works occurring then.

In data collection, a long-accepted industry standard has been that information should preferably be collected in 'neutral months', when traffic patterns are counted to be 'normal' or 'average'. These months are May, June, July, September, October and November. The protocol and industry standard for demand surveys allows data collection at any time, but would factor down any information collected in December nearer to Christmas, and factor up any collected in January or February, avoiding Summer holidays when schools are not active altogether.

We would therefore believe that all the recent survey periods used to collect rank information in Torbay are within those average neutral months and therefore counted as typical. Further, as far as is practicable, atypical periods such as the Air Show weekend, should also be avoided, and were in all cases. Further, where possible, major roadworks should be avoided although it is not always possible to avoid emergency road works although licensing sections are always asked to advise us of any out of course events during surveys so that we can take these into account in interpreting the results.

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ISUD values and their detail

The actual 'ISUD' equation values being used defining the unmet demand and its significance at this point in time are:

Average passenger delay (APD) – 1 minute 22 seconds, or 1.37 minutes

Off peak hours with any delay – 39.77%

Proportion of passengers travelling in hours when APD is one minute or more – 42.24%

Seasonal value – 1 (the survey is in 'neutral' months)

Peak factor – 0.5 (the survey has a peaky profile)

Latent demand – 1.008

For the sake of clarity, these values relate to all council operated ranks – meaning Paignton and Torquay station ranks are excluded (there were no other active council-provided ranks in Paignton at the time of the survey)

All these are combined to provide (using actual and more detailed numbers from the model) an ISUD of 1159.99, a long way beyond the cut-off value for unmet demand to be significant of 80. It must however be remembered that the ISUD equation is exponential rather than straight line.

As already partly discussed, the peak factor dampens the impact by halving the resulting factor.

The seasonal value has no impact.

The latent demand factor only very marginally increases the number of vehicles needed to reduce unmet demand.

If APD is a minute, it also has no impact. If it is more than one, it inflates the ISUD value, and if less than the minute, deflates the value.

The two main parameters are the "proportion values" (ones that are the share of hours or passengers within a total). In the latest evaluation, both are very similar with the proportion of passengers travelling in hours when APD is a minute or more marginally higher. Both of these parameters can be zero, in which case there can be no unmet demand irrespective of the levels of any of the other parameters. This means that there must be some off-peak delay to allow unmet demand to be significant – overcoming any concern or fear that the ISUD statistic is biased to night demand.

Introducing extra vehicles will nearly always reduce APD. If the vehicles service off peak hours, that value would reduce. If they service hours when APD is one minute or more, they will reduce that parameter, and the off peak parameter if that hour is also off peak.

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It is very hard – and legally impossible – to restrict any vehicle to meeting demand at any place or time. Further work below makes the assumption that extra vehicles service the hours being considered. Other analyses make the assumption that any new vehicles will all behave in similar distribution manners to the current fleet.

Modelling of reducing unmet demand

We have already defined 'unmet demand' as when a passenger arrives at a rank and finds no vehicles there ready for immediate hire. The level of unmet demand then becomes significant using the ISUD tool calculation if the calculated value is 80 or more. Having terms 'unmet demand' and 'significant unmet demand' can be confusing as they are different in terms of their requirements under Section 16 of the 1985 Transport Act. There is no requirement to completely eliminate unmet demand, which is almost impossible in any event, but the key is ultimately the view of the licensing authority regarding if any unmet demand observed is actually 'significant'.

The process by which our estimate of levels of unmet demand occur includes detailed modelling of the matching of passengers and vehicles at each rank. The detailed model can therefore be used to insert additional vehicles to the point at which unmet demand (all passenger waiting) is completely removed from ranks by day or hour for specific periods.

The first important point is to understand what hours and locations actually make up the unmet demand, and then how that combines to become significant.

Whilst our confirmation of the significance of unmet demand relates to the situation excluding Paignton station, our modelling below works using the full set of information gathered during the survey given that Paignton station operations cannot be readily divorced from the overall situation when looking at how extra plates would change the service provided to the public.

It was found that the hour and rank with the highest contribution to the total level of delay was The Strand, Torquay, in the midnight hour Saturday-Sunday. This sole hour provided 5.33% of all delay hours. That same hour saw 4.33% at Paignton Station, 0.78% at Bank Lane Brixham and 0.28% at Cary Parade, giving that hour some 10.67% of all delay hours during the survey period.

When listed by percentage of overall delay by hour by rank, The Strand had eight of the top ten proportions, whilst Paignton Station had the other two. The lowest percentage in this top 10 was 2.3% and this top ten accounted for

over 37% of all delay hours. They were focussed on the period between 23:00 Saturday and 03:00 Sunday.

However, all delay hours were over a total of 183 different rank hours. When times were considered, nearly every hour from 07:00 Thursday through to Sunday 04:00 saw delay at some rank suggesting the issue to be more widespread than focussed.

However, in terms of targeting the key hours where improvement would see the best return, it is clear the period over Saturday – Sunday is the one where the most return would be obtained. Obviously, any extra vehicles in that period would not just operate for a few hours, so other benefit would be obtained in addition.

Two options were taken. The first (Option 1) took the 23:00 and midnight hours at The Strand rank detailed information and inserted sufficient vehicles in order to eliminate all passenger waiting in those two hours at that rank. The number of vehicles that had to be inserted over the two hours was 19. This removed all unmet demand in those two hours in full, completely, providing no passenger waiting at all in those two specific hours.

It is accepted that Option 1 looked at just The Strand rank. The modelled impact purely changing these two hours only actually reduced the level of significance across the full area (but on the value excluding the private ranks) by 30% (from 1159.99 to 814.88). And those extra plates would definitely not just work two hours therefore reducing the index further although it is impossible to predict exactly how.

Assuming those plates also removed delay for the six previous and four post hours on the Saturday/Sunday, and also impacted the worst four hours on the Friday/Saturday, and the worst six hours on the Thursday (all at The Strand) saw the index for the full area (again excluding the private ranks) reduce 88% to 144.86, not far from reducing the level of significance to below 80, and all based on adding just the 19 plates.

Further review seeking to take the index below the 80 value required assumptions much more difficult to have confidence in so was not taken further. However, the value of 80 was almost certainly within the margin of error expected for such modelling, and also the extra plate making the total to 20 would also have an impact across the area, so again there is some suggestion the 20 could achieve an ISUD value below the 80 level of significance.

Option 2 considers the four ranks across the area which at midnight on the Saturday-Sunday had observed unmet demand. This option is based on the full model, including all ranks and therefore the private ones. Most of the unmet demand was at The Strand and Paignton Station. A total of 150 passengers were observed having to wait. Using a 1.9 occupancy suggests 78 more vehicle departures (not vehicles, see below) would be needed to remove the unmet demand fully at this time. Based on the observed return to rank time (see below), this led to the suggestion that 26 more vehicles within that hour across the whole area although this would again also totally extinguish unmet demand at this time, i.e. no passenger delay at all in that hour at all four ranks. Again, the modelled 'pure' impact on the full set of observations (i.e across the full survey period) reduced the index from 1801 to 1490, a 17% reduction just using the change introduced for these four hours (the same hour at each of the four locations), and again this is an underestimate given those would certainly cover other hours and ranks.

For this option, moving on to clarify the impact of the 26 across the full survey was not modelled given the potential choices required were less easy to make, but in both cases, the extra vehicles will certainly service and reduce unmet demand in other hours. This means these estimates can be used as proxies. These numbers therefore suggest that the recommended 20 is more appropriate than 17 (10%) but that 26 is not necessarily better than 19. (based on the very specific two-hours at one rank against four locations for one hour, but tested against the full relevant total for each option).

Another calculation on a broader level suggested that total elimination of unmet demand might need up to 115 vehicles more based on an estimate of the maximum possible number of trips per active vehicle, although again the requirement is to reduce the index to under 80, not totally eliminate unmet demand, given that it is accepted there will nearly always be some unmet demand arising from mismatches between vehicle and passenger arrivals.

On these bases, given that the ISUD index is exponential, the final number to reduce ISUD to less than 80 would probably be in the order of 35. The benefit of adding a given number of plates (and by this we mean 20, not 115) is that their impact can be seen and tested and further policy options then considered and moved forward based on evidence gleaned. This also allows the identification of any unexpected or unintentional consequences that might arise in the complex world of licensed vehicle operations. This means to say that our estimates suggest 20 could be sufficient if all provided favourable improvements, but might not do so for a myriad of reasons.

These include:
- Release of suppressed passenger demand
- Some drivers seeing reduced income working longer
- Some who rent vehicles gaining their own vehicle and choosing not to work hours when those vehicles effectively reducing supply at critical periods
- More off peak drivers moving to booking circuits

From our understanding of trade reactions the benefit of introducing 20 then perhaps more in due course is likely to be higher than a direct introduction of 35 now, as the higher the number of plates the bigger the 'shock' introduced to the industry and therefore the more negative a reaction by those currently within the providing trade.

Specifically, we would not recommend adding 26 or 35 at this time as the principal is that once issued plates cannot easily be removed, so it is better to err on the side of caution to prevent too much economic or operational shock to the current trade which would lead to unforeseen impacts some of which might reduce overall impact.

Other comments:
The modelling also requires some of the general operational parameters of the current service to the public to be confirmed. As explained in the main report, sample plate observations were undertaken to identify the number of vehicles active at key times. This information can also be interrogated to identify the return to rank times.

Over the three-day sample, 72% (53% over two days last time) of the active available fleet (AAF) was observed. The comparison suggests vehicles are servicing more of the whole area now than in 2020. There appear to be more vehicles servicing Paignton and Brixham now, but as shown below including more vehicles servicing beyond Torquay. It must be remembered that this survey is a sample and that it is not at ranks but nearby, so it will capture vehicles passing through or undertaking non-rank based trips, or trips from ranks in other locations passing this site, as well as those working at the ranks.

Further analysis was undertaken considering what the plate data told us with regard to return to rank times. A review was undertaken of the three 23:00 to 01:00 periods on the Thursday-Friday, Friday-Saturday and Saturday-Sunday of the rank survey, at the Cary Parade plate observation point. This was the point with the most plates observed and identified most vehicles servicing The Strand rank.

Plates were listed by time observed. Given that these hours mainly saw vehicles arriving at ranks being directly taken by customers with minimal wait times at the rank, the observed return to rank times effectively show long a vehicle was out and back from the rank, and therefore available for further service. The Thursday average return to rank time for a vehicle was 23 minutes and 44 seconds. That for Friday was very similar at 23 minutes 27 seconds. The last set of observations suggested the return to rank time per vehicle was on average 21 minutes 29 seconds.

These times suggest that a vehicle can undertake about 2.6 trips per hour. This value can be used to identify the extra number of vehicles that might be required to move a given excess of passengers (in terms of trips, i.e. divided by the typical passenger occupancy).

Other pointers to number of plates to issue:
A review was undertaken of the plates not seen. It must be remembered the plate survey is a sample, covering Thursday / Friday / Saturday during the rank observation period which may miss vehicles whose work patterns do not include the surveyed hours. However, the sample hour structure has been developed over time to maximise the results obtained, so the level of missed working vehicles should be low.

Of the 48 hackney carriage plates not seen it was suggested by licensing that 10% (5) were in the process of being transferred at the time of the survey due to driver retirement for a range of reasons and a third (16) were known either to only service school contracts or other specific client bases. A further 29% (14) were known to service school contracts but were still believed to service ranks, with the final 27% (13) unclear why they were not seen.

One of the two hcv wheelchair accessible vehicles (WAV) were not seen in the plate review although the vehicle is believed to service ranks but mainly services school runs so was probably operating out of the time period the plate survey covered. On this basis, it is clear there are definitely 21 plates that were almost certainly not active at ranks over the survey period.

A further test was to compare the impact of the extra vehicles seen at Brixham to the improvement to the ISUD index. Between the last survey and the 2023 survey, the number of vehicles observed at Brixham (albeit over two days) increased from 29 to 33 different vehicles, a total of some 14% more. The change in the ISUD index between the same two surveys for Brixham was a 30% reduction. The suggested 20 plates are 12% of the fleet.

Estimating the extra numbers of vehicles is difficult because:

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- There is no means by which vehicles can be expected to work 24/7
- There is certainly no way that drivers can be expected to work long hours even though the working time requirements have been opted out from
- There is no way any authority can require any hackney carriage vehicle only to be used for rank work
- A known benefit of licensed vehicle work is the element of choice given to people when they prefer to work
- Since the pandemic, drivers have tended to focus on work-life balance more than before
- Any assumption on extra vehicles assumes new vehicles will behave as the present vehicles do
- Total service levels are the sum of choices made by different drivers about their different vehicles
- Public demand is partly known in terms of from the operation of venues that might provide such demand and partly unknown again due to the range of decisions people might make culminating in their arriving at a rank
- If a new vehicle is given to someone currently renting a share of a plate, they will then have the option of working different hours to their current, if that includes the choice to move away from hours with unmet demand, that extra plate will not improve the situation

What is known is that rank and plate observations will provide a snapshot of performance of the set of parameters at play for those locations covered by any chosen survey. The elements of the ISUD equation were derived specifically to test not just one element but a range of different but related elements of hackney carriage performance to the public.

The worst issue is clearly partly related to the extra restriction on servicing the only rank in Paignton. We understand that changes coming will imply this restriction will be removed and a rank better located to service general demand provided. However, at best the impact of this change would need to be reviewed perhaps within six months of the change being made. What is not known, however, is when this change will occur.

Further, attempts were made in the past to provide non-permit ranks in the area (and in fact some ranks do still exist), but these were never used by the trade.

It must be remembered that the unmet demand has arisen not from growth in passenger demand but at a time when this has remained effectively stable. And that much higher demand in 2018 was serviced by the same fleet without any unmet demand that was significant. The growth of unmet demand in 2023 must therefore be the result of the level of availability of hackney carriages at the ranks having reduced. This less frequent attendance at ranks by the same fleet of hackney carriages can be associated with several factors, such as reduced levels of multi-shifting (fewer vehicles with multiple drivers), more of the fleet engaging in pre-booked hires, or more focussing on corporate work such as airport transfer or contract work such as for schools, rather than public facing work such as rank hires or hailing pick-ups.

The conundrum is that new vehicles and drivers cannot be directed at any particular location or time, which could minimise the level of requirement. It also has to be assumed that any issue of plates would be taken up by people observing there was demand to be met. This might occur from the private hire fleet but that might result in simple transfer of supply, although there is no way of knowing if this did result in shortages for booked demand. Licensing have advised us that a number of applications are waiting.

We now understand that revision of rank provision in Paignton is under consideration. Whilst details are far from being agreed or made public, the essence will be broadening provision both geographically and in terms of making provision of ranks that will be available to all Torbay hackney carriages without additional fee. Both elements will improve the opportunity to enhance service to those wishing to use hackney carriages in Paignton although inevitably a time of people and drivers getting used to the new situation will be necessary.

As an aside, in our experience, use of the data from the rank surveys can be made by the trade to understand when issues were identified and allow them to also attempt to make remedial action. This was effective in one study (albeit before COVID) in the South East. Again, the only way to test any such actions would be through the survey.

Level of certainty of impacts

We are confident that adding a further 20 plates at this time will reduce the level of unmet demand in Torbay and do so to a noticeable degree. Our model test shows that were 19 of these to service the worst case two hours of unmet demand, they would eliminate the unmet demand at that point, which accounted for just under 10% of total waiting time for the full survey period. Those plates would also service other hours and therefore reduce other total waiting times, and therefore further reduce the level of unmet demand. The chance of them reducing unmet demand is high given the overall wide spread of unmet demand that was observed.

We cannot, and do not believe it is possible or practicable, to confirm a number that will take the level of unmet demand to a calculated ISUD value less than 80. As stated above, adding 20 plates should reduce unmet demand to a noticeable degree although in the complex world of licensed vehicle demand even this cannot be firmly promised (for example, emergency road works might occur during any test survey which could not be foreseen, there could be an issue with vehicle availability such as spare parts, train strikes..).

Hence although the extra plates should reduce unmet demand, in reality the only way (in the absence of public complaints, or intelligence from the trade) to know this has occurred is to undertake further rank observations and also ensure these are not known about by the trade to ensure they observe typical observation. And to ensure all potential influencing parameters are noted and a reasoned view taken of their impact.

Our experience suggests that the impact of adding new plates tends to take six months or more from adding of the last plate to their full impact on demand.

Hence, were a decision made at committee with immediate effect, it could be perhaps the end of November when all 20 new vehicles were in place. This would allow repeat surveys in May or June 2025, which we would advise should cover all ranks over three days including the plate observations to ensure robust information. The only issue might be timing of the Paignton changes but that could be considered closer to the time.

The report produced following the repeat survey data collection would provide a clearer indication of the overall impacts as well as any unintended consequences and would allow the committee to have an up to date assessment of the significance of unmet demand at that point and a much better understanding of how the local hackney carriage operation and public service have stood up.