

ADDITIONAL EVIDENCE : 'HIGHWAY IMPACTS' - DEVELOPMENT SITE HC2(u) & MATLOCK TOWN CENTRE

From the very early days of the preparation of DDDC's current Local Plan it was obvious, to me, as an experienced chartered Civil Engineer, that the magnitude and location of the proposed Housing Development sites were likely to impose significant. From the very early days of the additional 'strain' on parts of the existing road network.

Having noted the stated responses of DCC, the Highway Authority, in the context of the very early stage of the proposed individual 'site assessments', it was clear they were not anticipating any such problems to emerge that could not be 'overcome'.

In addition to my professional status, as a Matlock Town Councillor and Ward Member in which the 'significantly sized' Development Site - now referenced as HC2(u) was proposed, I also had to consider local concerns.

[It was 'blatantly' obvious that the proposed increase in the 'housing stock' in the Matlock Town area (see later) published AECOM Report : Table 4.2 : Existing Dwellings 5113 – Proposed Dwellings 1687 – Increase 33%), would produce unacceptable Traffic Impacts. This would be compounded by the fact that the 'key' Matlock Town centre roundabout (Crown Square) had reached 'Capacity' in 2015 – as witnessed by the present daily traffic conditions at the extended peak periods – which are already of concern.]

My initial reaction, in February 2016, was to query with DDDC the methodology that DDDC/DCC would be would utilize to examine the local and network Highway Impacts, produced throughout the Local Plan, (incorporating my particular reference to the Matlock area) by the generated traffic from the proposed Housing Development sites.

I was informed these would be matters for consideration/decision at a later stage, however it was considered the usual process of determination of certain aspects would be undertaken on a site by site basis when an actual Planning Application had been submitted. (I understand this response is still being stated by DDDC at the present time).

I replied to DDDC that, professionally, I would have expected the following to be adopted :-

- i) The engagement of a recognised specialist Engineering Consultancy.
- ii) The use of a dynamic re-assignment traffic model
- iii) The detailed examination, using a 'holistic' approach, of the wider Highway network implications of both the 'whole' and individual proposed Development Sites . [DDDC's stated 'usual 'process would be completely unacceptable]

Prior to the publication of the AECOM in June 2016 I produced the results of a comprehensive Manual Traffic Count, in line with the relevant DfT/DETR documentation, to establish the levels of the existing traffic on the 'local' roads that would be affected by the proposed HC2(u) Development. Copies of the Documentation were handed to DDC and DDDC at the end of February 2016. Comment was made on the findings in the Report, sufficient evidence was produced to establish concerns as to the likely effects of the traffic generated from HC2(u) on the 'local' road network.

In particular a clear recommendation was made regarding Cavendish Road that no access to and from HC2(u) should be made from the Pinewood Road/Wolds Rise/ Cavendish Road corridor – primarily due to the significant detrimental effects that already exist due to the present numbers of the parked roadside vehicles on Cavendish Road. [Noting, this in turn, could detrimentally affect the situation at the Wolds Road/Chesterfield Road junction.]

Attached (Appendix A) is a typical record of the record of parked vehicles taken at the time of the Manual Count (The disruption to traffic due to the extent of the parked roadside vehicles show can be 'readily observed')

It is a matter of record that there are no specific 'mitigation' measures that can be implemented to reduce the effects of the site generated additional traffic on this corridor.

The detailed effect of the present and the additional site generated traffic should be examined using VISSIM-ENPRO models or similar. A copy of the Manual Traffic Count and its results can be made available, if required.

Following the publication of the AECOMM Report on 16th June 2016 I commenced its examination using, as a clearly relevant example, the key Matlock Town Centre roundabout of Crown Square and the Development Site HC2(u) - (as the 'main' generator of the increased traffic in Matlock)

Initially the following 'relationships' should be made clear :-

Derbyshire Dales District Council : Part of the Government Ministerial Department titled 'Department for Communities and Local Government'. As a local Planning Authority, the District Council manages and administers the planning process and are responsible for making decisions on most planning applications emanating from within their District. In the planning process the District Council the District Council may ask for the views of statutory consultees, including the County Council (as Highway Authority)

Derbyshire County Council : They are part of the Government Ministerial Department titled 'Department for Transport'. Highways England is a government –owned company with responsibility for managing the motorways and major roads in England. It has 'delegated' the remaining road network to 'Highway Authorities etc' such as DCC who have 'vested powers' with a remit to 'operate and maintain' these remaining Highways within their County.

AECOM : A private company of Consulting Engineers engaged jointly by DDDC & DCC, they have the responsibility to their clients to use their 'technical expertise and knowledge' to assist their client and provide the information required. Basically, they agree to provide the 'information' contained in the Brief of the scope of the work, (supplied by the Client) and the Client pays them the agreed 'fees' for the work carried out.

The basic underlying principal of Government Ministerial Departments is that they have clearly identified remits, areas of responsibilities and 'working practise's , rules etc - they are essentially 'equipped' to deal as 'stand alone' entities in matters under their jurisdiction.

It is acceptable, however that a Highway Authority, can consider their responses to a Planning Authority in 'their own terms' (In this case the "6c's" guidance documentation) for the more 'minor' proposed developments – but they have to be 'cognisant' of and follow the Highways England methodology etc when appropriate.

The case under consideration is, without question, is within this category. It is so far removed from the more normal developments of a very few additional houses, due the sheer magnitude of the housing numbers, clustered on separate sites, the land area required, the topographical restraints, with no mitigation or physical improvements possible, parts in designated Conservation Areas and the existing significant stresses on the Highway Network.

As I stated, previously, the 'overall approach' developed by AECOM (under the direction of DDC & DDDC) is completely inappropriate and the interpretation of the actual 'facts' does not reflect the 'true reality' of the situation.

I am not 'standing alone' in making this statement – I have contacted other Professional colleagues, an independent company of Consulting Engineers and of course Highways England. All concur with my findings.

Importantly, following direct discussions with the appropriate Officers of Highways England – although this case is outside their remit/jurisdiction and they therefore cannot comment directly on this particular case – it was made clear that in such a case the Highway Authority would have had to prove to Highways England that their proposals were 'sound' and 'acceptable' using the methodology, documentation, standards etc of the DfT and not those either formulated by the themselves or the DCLG. I have an email from Highways England outlining the basic Principles.

Note: I would make it clear the Highways Network Impacts from such 'large scale' Developments have to be considered in such terms. Further the 'reliance' of the Developer to 'provide solutions' at the Planning Application stage, as stated by DDDC, is also completely flawed.

It is therefore clear that the AECOM Report (I repeat under the direction of DCC and DDDC) is completely inappropriate. It does generally 'gather' the majority of the relevant 'facts' together satisfactorily (see later comments). It completely changes the methodology 'degenerating' into a confusing , almost convoluted, interpretation of the facts to produce an unclear reasoning as to the acceptance of the Highway Impacts and a reliance on Sustainable Transport interventions to 'ameliorate' the situation. It should also be noted that the title of the Report and the majority of the wording relates to that of Planning Authority Guidance etc - not that of Highways England/DfT.

It therefore now only remains for me to present the 'detailed factual evidence' and its true 'interpretation' to show the actual realities of this matter.

In order to establish this 'reality' this involves a necessarily 'mathematical' approach and an understanding of the 'technical ' nature of the material produced.

It is a fact that I have previously made DDDC aware (with respect) of the fact that they do not have the remit, authority and appropriate Officers, with the required necessary Professional qualifications, to comment directly on such matters.

In addition to the ‘overarching’ principle now established I would first inform you of the following additional ‘disconcerting’ matters either noted in or resulted from the AECOM Report :-

- No attempt has been made to ‘inform the Public’ of the increase of the levels of traffic that would result from the housing development sites in a clear understandable manner and how this could be reduced.
- The analysis does not take into account the pedestrian crossings at the Town Square roundabout – observations show the length available to queuing traffic is inadequate. Currently traffic queues back onto the roundabout a times blocking another entry point to the roundabout (negating any ‘platooning’ effects)
- The ‘underlying’ traffic growth factors have been considered as minimal (despite the increase in population, car ownership and observed growth)
- The ‘emphasis’ is on travel to work journeys by the residents of the new housing developments (quite rightly as there are insufficient employment opportunities in the local area)

However no regard would seem to have been made for the Development sites that include retail and industrial usage (separate trip factors in TRICS). These factors must produce increase in traffic due to the necessity to have inbound deliveries of ‘raw materials’ and outbound deliveries of ‘finished products’ etc.

- DDDC is responsible for Local Air Quality Management. In addition to their normal ‘duties’ in this respect should there not have been a consideration of the addition pollution resulting from the additional generated traffic from the development sites – particularly due to the forecasted increases in queuing lengths on the arms of the Crown Square roundabout (Note: There is a degree of guidance available from DEFRA and a number of ‘learned’ papers)
- No attempt has been made to present a case to show the ‘economic viability and cost benefits’ of the proposals. (particularly in view of the resulting dis-benefit in monetary terms to the ‘economy’ resulting from the ‘time lost’ by the additional queuing traffic.
- It is disappointing a dynamic re-assignment traffic model was not utilized in view of the unstated cost difference. Part of the initial cost could have been ‘set aside’ as basically it could have been utilized for future scenarios.

Moving on to the analysis let us examine the effects of generated traffic from the development sites on Crown Square Roundabout – brought about by the increase in the housing stock as referred to previously (AECOM report Table 4.2) :-

Table 4.2: Additional Dwellings Proposed under DDDC Local Plan – Percentage Increase

Location	Existing Dwellings*	Proposed Dwellings	Increase
Matlock Town	5,113	1,687	+33.0%

Firstly copied from the from the AECOM Report :

Increase in Traffic Flow: Table 5.1 shows the change in traffic from the current (Base) situation to a future (Design) scenario, without consideration to sustainable transport initiatives. The table shows changes in link flow on key routes, and total traffic flows at key junctions.

The changes in flow must be considered against an overall change in dwellings within Matlock town of 33% (Table 4.2), although the changes in flow noted below also consider those developments in the Matlock area (which includes Matlock Bath and Darley Dale etc.)

NOTE:

- i) For ‘Observed 2015’ read ‘existing conditions’ – In Table read ‘Base’
- ii) For ‘With Planned Development ---’ read no Mitigation or Sustainable Transport measures – In Table read ‘Design’
- iii) The point at which link capacity is reached is 100%. Beyond this the link will rapidly become unable to function’
- iv) The number of links above capacity.
- v) The increase in traffic flows for Crown Square is 57% (for a roundabout having reached its capacity in 2015)

vi) Even using the 'Planning based' methodology each of the key junctions in Matlock would experience above their '30% threshold' criteria.

Table 5.1: Observed 2015 and 'With Planned Development' Traffic Flows in Matlock, no sustainable transport interventions

Links	AM Peak Hour			PM Peak Hour			% Increase	% Link Capacity
	Base	Design	Difference	Base	Design	Difference		
A615 (Bakewell Road)	1,213	2,092	879	1,329	2,289	960	72%	104%
Bridge (one-way)	387	520	133	364	446	82	29%	69%
A6 (Dale Road)	1,001	1,536	535	1,120	1,672	552	51%	134%
A6 (Bakewell Road)	1,359	2,101	742	1,492	2,256	764	53%	103%
A615 Causeway Lane	978	1341	363	982	1356	374	38%	62%
Bank Road	679	1,327	648	564	1,231	667	106%	106%
A632 Lime Tree Hill	667	911	244	527	778	251	41%	73%
A632 Chesterfield Road	958	1,849	891	855	1,773	918	100%	84%
Key Junctions (Total Junction Inflow)								
Crown Square	1,751	2,762	1,011	1,830	2,872	1,042	57%	
A6 / A615	1,802	2,963	1,161	1,938	3,189	1,251	65%	
Matlock Green	1,650	2,327	677	1,474	2,172	698	44%	
A6 Bridge Signals	1,001	1,536	535	1,120	1,672	552	51%	

From Table 5.1, each of the key junctions within Matlock could be expected to experience increases in traffic above the 30% threshold identified in the IEA guidance. As such, there would be a material impact at these junctions based on the amount of housing proposed, under a scenario in which there was no complementary mitigation.

Using the traffic flows as above – for Crown Square roundabout - the Program ARCADY output (from the AECOM Report) :

NOTE :

- i) This shows actual factual results of the 57% increase of traffic flows.
- ii) The parameter results shown in **red** are above acceptable levels
- iii) The magnitude **Large** is an interesting statement.
- iv) The 'non-consideration' of the pedestrian crossings

Table 5.2: Performance of the Crown Square Roundabout, no sustainable transport interventions

Scenario	AM Peak Hour (0800 – 0900hrs)		PM Peak Hour (1700 – 1800hrs)	
	RFC	Q	RFC	Q
Survey 2015	0.86	5.10	1.14	33.10
Design	1.77	LARGE	2.04	LARGE

RFC = Ratio of Flow to Capacity. A measure of the trafficking at the junction in relation to its ability to accommodate such flow, reported on a worst-arm basis. Q = Mean Maximum Vehicle Queue, reported on a worst arm basis.

Table 5.2 shows that the Crown Square roundabout is operating at capacity in 2015 (i.e. without any development added to it). This analysis does not take into account the pedestrian crossings on three of its four entry / exit arms. As such, additional traffic routing through Crown Square will add to queuing at this location, as is shown in the same table.

From the vast quantities of irrelevant computer output received from DDDC the following ARCADY output was received in response to my F.O.I request (The only really relevant item actually received)

NOTE :

- i) The terminology now used is as that in Table 5.1 - with the addition of A1 presumably as a 'unique' reference
- ii) There is an exact correlation with the 'basic' results in Table 5.2
- iii) Further necessary parameter information is now included (requested in the F.O.I.) – LOS – Loss of Service, Delay (s), Junction Delay (s)
- iv) I queried the exact definitions of some parameters (requested in the F.O.I.) as they do not appear to be defined as stated in the ARCADY Manual.
- v) There is no 'key' to determine which roundabout 'Arm' is numbered 1 to 4

vi) The LOS parameter 'categorisation/ colour code' (A to F) does not appear to have any direct compatibility to Table 3.6 'Congestion bands and ratio values used for highway network plots, in Section 3.5 of the AECOM Report – and is in fact not defined. (Also bearing in mind there is also no correlation or explanation between Table 3.6 and Figure 3.7 of the Report. Had this matter been used to 'illustrate' the individual ARCADY output result, it would have gone in no small to make it clear what – in reality – the Highway Impact effects actually mean – particularly for the Public)

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)
A1 - Base										
Arm 1	1.64	7.34	0.62	A	17.43	1.36	6.25	0.58	A	64.21
Arm 2	0.00	0.00	0.00	A		0.00	0.00	0.00	A	
Arm 3	2.17	11.59	0.69	B		3.13	14.82	0.76	B	
Arm 4	5.10	45.85	0.86	E		33.10	254.36	1.14	F	
A1 - Design										
Arm 1	3.48	13.45	0.78	B	926.88	3.65	13.20	0.79	B	1185.46
Arm 2	0.00	0.00	0.00	A		0.00	0.00	0.00	A	
Arm 3	190.95	662.69	1.30	F		192.38	653.24	1.30	F	
Arm 4	315.60	2456.85	1.77	F		407.51	3534.03	2.04	F	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

*D1 - Base, AM * model duration: 07:45 - 09:15
 D2 - Base, PM model duration: 16:45 - 18:15
 D5 - Design, AM model duration: 07:45 - 09:15
 D6 - Design, PM model duration: 16:45 - 18:15

Run using Junctions 8.0.4.487 at 22/09/2016 16:12:29

The actual values of the parameter 'Q' are now made clear : They are of a magnitude that foretell a completely unacceptable future - note the following 'crude' calculations :-

Parameter Q (PCU) – P.M. Design Arm 4 (assumed Bakewell Road - inbound) **407.5 (PCU)**

Assuming 70% car, 30% bus, lorry ,van / PCU vehicle 5.75m :- **Length of queue 3000 m (1.85 miles)**

Parameter Delay (s) - P.M. Design Arm 4 (assumed Bakewell Road – inbound **3534 seconds (1 hour)**

The above, however, is effectively a worst case scenario – there are further 'allowable' factors to consider that will reduce these values. These 'factors' fall broadly into two categories :- a) 'Computer based' corrections and b) Sustainable Transport initiatives.

The AECOM report is confusing in this respect – modifying a previously stated 'reductions' and 'mixing' the categories.

I would now draw your attention to Table 5.7 : Total Junction inflows with Sustainable Transport Initiatives in the AECOM report.

NOTE:

i) The Base AM and PM traffic flows are as already seen in Table 5.1

ii) The Peak Hour 'Design' calculations AM 1,751 → 2448 and PM 1830 → 2546 produces a maximum % increase of 39%

iii) Acronyms :

PTP – Personal Travel Planning – reduction ? (∞10%)

TB – Trip Banking – reduction ? (included as part of PTP ?)

TP – Travel Planning – reduction 7.5%

PS - Peak Spreading - reduction 2.5%

Referred to (primarily in Section 5.5 et al in the report) – but not utilised ??

Area Wide Travel Planning

Development Travel Planning

Background Traffic

Table 5.7: Total Junction Inflows with Sustainable Transport Initiatives

Key Junction	AM Peak Hour			PM Peak Hour			% Increase
	Base	Base Minus PTP / Trip Banking	Design Minus Travel Planning / Peak Spreading	Base	Base Minus PTP / Trip Banking	Design Minus Travel Planning / Peak Spreading	
Crown Square	1,751	1,576	2,448	1,830	1,647	2,546	39%

I have stated above that I am not convinced as to application and magnitude of some of the %age reductions being made particularly for a 'small' town like Matlock (also considering its topography)

In view of the overall magnitude of the results seen thus far (and the likely relatively 'small' necessary changes to be made to the above) I do not propose to give my further reasoned comment on this aspect of the report (unless it is required at a later date). It would only worsen the extremely high 'residual' %age increase - still 39%.

However, at this point, the importance of the 'missing ARCADY output can be clearly seen. (This would be as the earlier actual ARCADY output shown titled "**Summary of junction performance**" but with the above traffic flow input of 39%.

This output was actually requested from DDDC as early as July 2016 and on refusal escalated into an F.O.I. request to the Information Commissioners' Office. See separate email send on this matter.

The 'absence' of this missing information is, not however, 100% 'crucial (but nevertheless the evidence to be presented would have been 'enhanced' by the actual knowledge gained from the requested ARCADY results)

A rather crude proportioning of the output results could be made (by using the input percentage increases) . However as demand (traffic density) approaches the capacity of a road or junction the onset of congestion leading to complete saturation, traffic engineers have has been found difficult to fully predict the point at which this occurs.

Given the magnitude (39%) of the 'reduced' increase in traffic flows there is no prospect that the outcome will show the normally excepted parameters (referred to previously) with be reduced to below the permitted levels, particularly as the roundabout has been already classified as having reached its capacity. (As can be seen by observation of present traffic situation)

I refer to the statement in Section 6 ; Conclusions and Summary of the report :

"It has been assumed that each development site would require a specific planning application and thereby be supported by a Transport Assessment. These individual TAs would examine the specific way in which these sites would be safely accessed. Given the constraints in both Matlock and Ashbourne, it has been further assumed that both proposed sites and existing households would be targeted with a programme of sustainable transport interventions to minimise single occupancy car use.

As such, a starting point for the local plan highways mitigation would be:

- Safe and Satisfactory Access from each individual site;
- Contribution to support local bus services;
- Site Travel Plan secured by S106, fully funded, monitored and enforced;
- Contribution to Area Wide Travel Planning.

Within Matlock, both the Crown Square and Matlock Green junctions are likely to require capacity improvements. It is unlikely that signalisation would increase capacity in either location; however, signalisation schemes would allow queues to be better managed. Housing allocations that achieve increases in traffic of 30%, 10%, 5% and which retain Status Quo conditions (assuming implementation of aggressive sustainable transport interventions) have also been identified."

The basis for the above has already been clearly identified to be completely inappropriate, 'glossing over' the realities and certainly does not produce a satisfactory outcome in terms of appropriate and acceptable standards.

It is however the last sentence of the above that finally indicates the 'reliance' placed upon "a return to the status quo conditions* (assuming implementation of aggressive sustainable transport interventions"

Note : * A DCLG statement not a DfT statement.

It is virtually impossible to see how this can be achieved given the magnitude of the increased traffic and the fact it is, undeliverable, purely aspirational and unenforceable and would not, under the methodology used, even be addressed until the later stage of the receipt of a Planning Application. The reasoning evidence and proof follow.

Firstly I would refer to Table 3.2 : Home to Work Main Travel Mode from the Report

Table 3.2: Home to Work Main Travel Mode

Travel Mode	Matlock
Underground, Metro, Tram	0%
Train	1%
Bus, Minibus or Coach	2%
Taxi	0%
Motorcycle / Moped	1%
Driving a Car or Van	69%
Passenger in Car or Van	5%
Bicycle	1%
On Foot	19%
Other Method of Travel	0%

(Source: Office of National Statistics, Census 2011)

This clearly shows, by far, the main mode of transport is the 'car or van' (69%). Given the topography of Matlock it is somewhat surprising (although the housing areas are pretty compact) that 'walking on foot' is as high (19%). All other modes are insignificant by comparison.

(Note: As an aside the often stated emphasis on cycling improvements makes negligible change to other travel modes)

The obvious reality is to 'target' journeys by car to make any meaningful reduction in the traffic flows. The accepted 'best outcome' of achieving this is by 'modal shift' from private car to public bus transport.

(This is referred to in the above Section 6 of the Report and is also proposed by the likely Developer of HC2(u) 'in waiting' currently in 'pro-active' discussions with DDDC and DCC at this time. They have already stated they would be prepared to fund a new bus service to serve the development site based on a 'half hour' schedule by means of a Section 106 agreement) See also attached Appendix B – a Passenger survey of the existing M1 bus service in Matlock – serving the Town centre / Asker Lane / Cavendish Park. (Note : some passenger counts and bus ticket records omitted)

The findings clearly show the extremely low passenger numbers utilizing this service and the negligible 'take up' of the residents within the 'catchment area' of the bus service.

This is not however surprising, hardly any such modal shift has resulted from the introduction of such measures in more rural areas like Matlock – (certainly of the magnitude required in this case)

Published 'learned papers' show some success in more major towns and cities – where there is more population and already a network of existing public transport – I have yet to find even a single paper than shows any success in rural areas.

The M1 bus passenger survey clearly examples the above. As stated previously the reality is completely aspirational and undeliverable.

Therefore it is concluded that the Highway Impacts, as found cannot be ameliorated to the level of the appropriate National based acceptable limits.

As the primary generator of these effects in the Matlock area, Development Site HC2(u) (currently 430 new homes) should therefore be removed from the Local Plan as it certainly renders the Local Plan flawed and undeliverable.

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