# Appendices

Design Plan | November 2017









# Contents

# Appendices

- A Brentwood Transport Masterplanning Report by Project Centre
- B Brentwood Town Centre Design Plan: Socio-Economic and Market Findings by Bilfinger GVA





# PROJECT CENTRE

# January 2017

# Masterplanning Report

# **Brentwood Transport**

Brentwood Borough Council

# 1. **INTRODUCTION**

Project Centre has been commissioned by Levitt Bernstein, on behalf of the Brentwood Borough Council, to produce this summary of our findings relating to the masterplanning of Brentwood Town Centre. This has been produced for inclusion in Levitt Bernstein's 'Brentwood Town Centre: Design Plan Strategies & Feasibility Study (December 2016)'.

This report provides information and analysis on the existing transport situation within the Town Centre and the impact of development proposed as part of the Brentwood Town Centre Masterplan, focusing specifically on the following issues:

Section	n 2: Existing Situation	Sectio	n 3: The Way Forward	Sectio	on 4: Ii
	Background	÷	Access and Movement		Sou
•	Congestion and Traffic Flows – AM and PM Peaks	1	Congestion and Traffic Flow – Baseline Future Scenario and Four	•	Роу
	Accident Patterns		Development Scenarios		
•	Parking Capacity	•	Development Impact on Parking Potential Opportunities		



Inspiration

uthall Broadway Boulevard

ynton 'Shared Space' Scheme

### 2. **EXISTING SITUATION: BACKGROUND**

Brentwood town centre faces a number of challenges that have formed the focus of this investigation.

Brentwood is the principal settlement of the Borough of Brentwood, being home to more than the 49,463 residents recorded during the 2011 census, and acting as one of the key commercial destinations in this region of Essex. As such, pressure upon the town centre to diversify commercially, develop a sense of identity, and provide key infrastructure to ensure continuing growth continues to intensify. With limited space in which to further develop the town centre, four parking areas across the town are being considered as part of this masterplan for residential, commercial and leisure development to ensure this continued growth.

Historically, access to the town has been predominantly achieved by private vehicles, and as such the town exhibits large areas of parking infrastructure to support this. The road layout, in combination with mini-roundabouts and enlarged junctions, has been designed to facilitate traffic flow rather than cater for other users. The High Street has been treated to make it more pedestrian friendly and less vehicle dominated. However, the likely increase in traffic volumes and congestion at major junctions indicate the need for a strong management strategy.

Crossrail services will be fully operational by 2019 from Brentwood station south of the town centre. The new services will provide fast and direct access to Liverpool Street by May 2017, and through central London by December 2019, thereby radically increasing the town's regional public transport accessibility. However, the town centre is separated by the railway station by a number of physical barriers, a lack of wayfinding support, and undefined pedestrian and cycle routes.

Other keys issues around the town, including High Street servicing requirements, accessibility issues and the need to expand the public realm place further stress on land use and the existing car-dominant infrastructure.

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### **EXISTING SITUATION: CONGESTION AND TRAFFIC FLOW** 2.

A review of LinSig / Arcady modelling recently undertaken by PBA Consulting as part of the 'Brentwood Borough Local Plan' has been undertaken in order to shed light on those junctions which currently or are predicted to exhibit congestion around the town centre. This included the majority of major junctions surrounding the town centre, and running towards the railway station.

This modelling was based on trip generation and distribution data, and assumed a strategic modelling approach, which distributes traffic between all origin and destination points, solely on the basis of the quickest route. Accompanying link speeds are supplied from TrafficMaster, to provide average speeds on all links for the desired time period.

The following scenarios were considered within PBA Consulting's report:

- Existing AM and PM peak traffic flows
- A baseline future scenario including a number of proposed developments both within and outside the town centre common to four development scenarios subsequently tested. This list included the Baytree Centre, Chatham Way, Westbury Road car parks.
- Four development scenarios, each including a larger development proposal outside the town centre.

Because the four development scenarios lie outside of the town centre and the baseline scenario includes three of those development sites being considered within this masterplan, focus has been placed upon the existing situation and baseline future scenario in this report. A brief summary of the results of the four development scenarios has been included to indicate how traffic conditions may alter as a result of external development in the surrounding network.

Results are provided graphically, and in terms of:

- RFC – Rate of Flow to Capacity.
- Delay The seconds each passenger car unit (PCU) is typically delayed.
- Queue – The number of passenger car units (PCU) typically in the queue.





### 3. **EXISTING SITUATION:**

### **CONGESTION AND TRAFFIC FLOW – AM PEAK**

AM peak modelling has revealed that most of the junctions / mini roundabouts surrounding the town centre operate below capacity during the AM Peak period with the exception of the following junction arms:

- All four arms of the Ongar Rd / Shenfield Rd / High St / Ingrave Rd double mini-roundabout, henceforth referred to as the 'double miniroundabout'. Particularly notable are the High Street, Shenfield Rd and Ingrave Rd junctions, which are functioning at 1.37, 1.58 and 1.71 RFC respectively, causing 17.5 – 36.6 minute delays and queues of approximately 97 – 300 PCUs.
- The northern arm of the Ingrave Rd / Queen's Rd mini-roundabout, which is operating at 1.12 RFC.

This is contrary to qualitative information provided to Project Centre during their investigation, which also seemed to indicate significant congestion issues at:

- The Kings Road / Weald Road / High Street miniroundabout.
- The Kings Road / Queen's Road mini-roundabout.
- The Weald Road / Western Road mini-roundabout.



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## 2. EXISTING SITUATION: CONGESTION AND TRAFFIC FLOW – PM PEAK

PM peak modelling has also revealed that most of the junctions / mini roundabouts surrounding the town centre operate below capacity, contrary to qualitative information provided, with the exception of the following junction arms (which are operating above the RFC threshold of 0.85 according to base model results):

 The High St and Ingrave Rd arms of the double mini-roundabout, which are operating at 1.56 and 2.18 RFC respectively, causing 27.1 – 60.1 minute delays and queues of approximately 120 – 430 PCUs.

As before, a number of junctions believed to be operating above capacity were not highlighted by this exercise.



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### 2. **EXISTING SITUATION:** ACCIDENT PATTERNS

Road accident clusters have been identified using Essex County Council data from August 2013 – August 2016. These indicate a number of locations where vehicles, and/or vehicles and vulnerable users, conflict including:

'Vehicle' Conflict Locations

- High Street/ Kings Road/ Weald Road junction
- The Queen's Road / Crown Street roundabout

Increased accidents in these locations are likely attributable to increase vehicular flow, speed change and interaction. It is notable that accident clusters do not seem to mirror those existing congestion issues identified in the AM and PM peaks, particularly on the double miniroundabout at the High Street's eastern end.

'Vehicle / Vulnerable User' Conflict Locations

- Kings Road / Primrose Hill junction
- The High Street (A1023) near Barclays Bank
- Ingrave Road (A128)
- Ongar Road

Increased conflict between vehicles and vulnerable users is logically expected on the High Street and Ongar Road, given the increased pedestrian footfall expected. However, the accident cluster pertaining to the Kings Road / Primrose Hill Junction is less easily reasoned and should be further investigated. It is thought that this may be sue to existing



visibility issues caused by the Brewery Tap public house's northern face.

Improvements that can be brought about via redevelopment should seek to address these accident clusters and promote safe universal access.



### 3. THE WAY FORWARD: ACCESS AND MOVEMENT

Barriers to access and movement across the town centre, from the railway station and the surrounding area have been identified as part of this investigation. Foremost amongst these barriers are oversized junctions and mini-roundabouts which strongly favour vehicular access. Several of these have been identified for potential modification with focus on removing existing barriers, altering traffic flows and providing clearer pedestrian and cycle routes to facilitate this movement.

Wayfinding improvements are also a key issue for this masterplan, particularly between the town centre and the station, so as to create a sense of place, increase streetscape legibility and encourage pedestrian flow. New public realm opportunities and possible locations for gateways to these spaces have also been identified and tied into this strategy, highlighting where pedestrian movement could take priority and generate new destinations. Specific locations to focus on include:

- Connections between William Hunter Way and High Street;
- Crown Street adjacent to the Bay Tree

Centre car park. Car flow in this location could be reduced by closing the existing Coptfold Road car park exit.

Design Plan & Feasibility Study | November 2017



A focus on servicing is also essential given the existing functions of William Hunter Way, Hart Street and Alfred Road. In particular, service vehicle access issues pertaining to the Iceland car park on Alfred Road must be considered in order to ensure safe access and prevent damage to the streetscape.

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### **CONGESTION AND TRAFFIC FLOW – BASELINE FUTURE SCENARIO** 3. THE WAY FORWARD:

As previously outlined, the baseline future modelling undertaken within PBA Consulting's report included a number of proposed developments both within and outside the town centre. These developments, a full list of which is available within the report, included the Baytree Centre, Chatham Way, Westbury Road car park sites.

This modelling, results of which are displayed overleaf, indicates that the Kings Road / Queen's Road and Ingrave Road / Queen's Road mini-roundabouts present the same capacity issues identified in the existing conditions. Specifically, the southbound Kings Road arm and the northbound Ingrave Road arm are those predicted to operate above capacity during the evening and morning peak respectively.

Interestingly, the double mini-roundabout at the High Street's eastern end is predicted to be functioning below capacity during both peaks following baseline development. This is contrary to results for existing congestion, which show that all four arms during the AM peak and on the southern and western arms during the PM peak are already functioning above 0.85 RFC. This is most likely due to the strategic modelling approach taken by PBA, which assumes that traffic is ideally distributed along the shortest routes between origin and destination in all cases. This represents a potential weakness of the modelling in predicting the traffic effects of the masterplan proposals.



### **CONGESTION AND TRAFFIC FLOW – BASELINE FUTURE SCENARIO** 4. THE WAY FORWARD:



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### **CONGESTION AND TRAFFIC FLOW – FOUR DEVELOPMENT SCENARIOS** 3. THE WAY FORWARD:

The four development scenarios considered by PBA consulting, full details of which can be found in their report, included:

- Option I: Development of Dunton Hills Garden Village.
- Option II: Development of the West Horndon Extension development site.
- Option III: Development of the north of Brentwood development site.
- Option IV: Development of the land East of Running Waters.

This modelling, results of which can be found overleaf, indicates that higher congestion and junction stress can be expected during PM. peak periods. Several junctions are consistently predicted to operate above capacity (0.85 RFC) including:

- The Ingrave Road arm of the Ingrave Road / Queen's Road mini-roundabout, which is predicted to function above capacity in both the AM and PM peak in all four scenarios.
- The northern arm of the Kings Road approach to the Kings Road / Queen's Road mini-roundabout, which is predicted as overcapacity in all pm peaks, as well as in Option III's AM peak.
- The Ingrave Road (southern) arm of the double mini-roundabout at the High Street's eastern end, which is predicted to exceed capacity in all PM peak periods.
- The High Street (western) and Shenfield Road (eastern) arms of the double mini-roundabout at the High Street's eastern end, which are also predicted to exceed capacity but less consistently.

The consistency of these findings across each scenario indicates the strong likelihood of worsening congestion and the need for mitigation on the noted junction arms.



# 3. THE WAY FORWARD: CONGESTION AND TRAFFIC FLOW – FOUR DEVELOPMENT SCENARIOS (OPTION I)





# 4. THE WAY FORWARD: CONGESTION AND TRAFFIC FLOW – FOUR DEVELOPMENT SCENARIOS (OPTION II)





### CONGESTION AND TRAFFIC FLOW – FOUR DEVELOPMENT SCENARIOS (OPTION III) 5. THE WAY FORWARD:





# 6. THE WAY FORWARD: CONGESTION AND TRAFFIC FLOW – FOUR DEVELOPMENT SCENARIOS (OPTION IV)





### THE WAY FORWARD: **DEVELOPMENT IMPACT ON PARKING** 3.

Based on the results of JMP's draft 'Brentwood Parking Strategy', an analysis of the town's existing parking requirements was conducted. This formed a baseline to predict how the parking needs of the four development sites, and the related changes in parking supply, might impact and place stress upon the town centre.

The results, shown here, should be considered strongly preliminary as they are based on predictions of future parking stress in town centre car parks, provided by JMP, and on the parking needs of new development predicted within Essex's county parking standards. As such, it does not reflect precisely, for example, the occupancy of on-street parking, the car ownership levels and trip rates associated with new developments, or the impact of other changes to the town centre being considered as part of this masterplan.

Overall, it is predicted that if all four development sites are completed, 500 - 2500 new spaces may be needed to support the town centre and new residents.

To ensure adequate parking, a combination of the following mitigating strategies will be considered in future stages:

- Expanding, reorganising and sharing car parks with other land uses;
- Reviewing sites for new parking;

			Spaces needed:					
	Option	Proposed Spaces	To support the Town Centre in 2025 (Highest Predicted)	For proposed residential units (Minimum)	For proposed non- residential floorspace (Maximum)	ls proposed parking close to meeting current guidance?	Overspill by 2025	Notes
William Hunter Way CP	1	282	372	179	976	No	1245	ential A1 (non 20% A3 cafes)
	2	615	372	179	538	Yes (Arguable)	474	Non-resid d as 80% / ores) and ransport o
	3	282	372	231	976	No	1297	Note: assumed food sta (non ti
Baytree Shopping	1	559**	531	33	0	No (Arguable with access to existing)	5	
Centre	2	225	531	65	153	Yes	524	
Westbury CP	1	95	90	36	1.1.1	1.1.2	1.1.3	
Chatham Way CP	1	105	113	30	9	Yes	47	

- Enhancing pedestrian, cyclist and public transport links; Altering restrictions on town centre car parks;
- Relocating longer-stay traffic to parking outside the town centre;
- Promoting new Crossrail services.



### 3. THE WAY FORWARD: **POTENTIAL OPPORTUNTIES**

At this stage, these proposed changes are preliminary in nature, focusing on where further investigation could focus and may yield potential benefit.



# 4. INSPIRATION: SOUTHALL BROADWAY BOULEVARD

Project Centre recently completed the detailed design and construction of the Southall Broadway Boulevard scheme. This has transformed the High Street, encouraging footfall and reducing congestion through the following major changes:

- Wider pavements
- Inset loading bays
- 20mph speed limit
- Relocation of bus stops
- Creation of 'Boulevard Zones' between street lanes, designed for safer street crossing by increasing driver awareness of pedestrians, reducing traffic speeds and providing central islands with low kerbs.

As the scheme was only recently completed, few statistics are available. However, the following benefits have been observed:

- Models indicated that traffic journey times and speeds would not suffer when road space was taken away, and this appears to be accurate.
- Awarded CIHT's award for 'Outstanding Street Design', being a scheme which 'benefited from an excellent, clear and simple vision on an extraordinarily busy street with a multiplicity of users' according to one of the judges.
- This has been observed as a place-making success, as it appears that it has become a more desirable destination.

Elements of this scheme could be used within Brentwood town centre to achieve similar results, increasing the multi-modality of existing space and attracting greater pedestrian traffic without negatively impacting traffic flow.









### **POYNTON 'SHARED SPACE' SCHEME INSPIRATION:** 4.

The Poynton shared space scheme has attracted a good deal of national and international attention both before and since its completion in March 2012. A design such as this should be applicable to the double roundabout at the Brentwood High Street's eastern end.

Key elements include:

- Well-defined gateways to the town, denoted by material changes and clear signage.
- Equal priority is given to all users and there is no vertical separation.
- Road narrowing (and reducing the number of lanes) without reducing traffic flow.

Key benefits have included:

- 80% of retailers reported an increase in footfall within the first 12 months
- Serious accidents fell from 4 7 accidents every 3 years before the opening to one accident in the three years following the scheme, and this was on the neighbouring High Street shared space, not the double roundabout.
- Average speeds have fallen to 20mph, despite no change in limits
- Congestion has been replaced by slow but continuous movement, leading to a significant drop in journey times.
- Pedestrians crossing the intersection have reported feeling much safer and easier, and that drivers often bow to pedestrian priority.







# 5. **DOCUMENT CONTROL**

Project Centre has prepared this report in accordance with the instructions from Clarendon Living Ltd. Project Centre shall not be liable for the use of any information contained herein for any purpose other than the sole and specific use for which it was prepared.

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