

Summary Note: Transport proposals for the Guildford town centre and hinterland masterplan (Allies & Morrison / Arup, September 2015)

Overview

This report has been prepared as a summary of the high level assessment work undertaken in support of the emerging Guildford town centre and hinterland masterplan by Arup in liaison with Allies and Morrison (the Masterplan team). It focuses on the development, testing and assessment of options for the layout of the town centre gyratory, as the major transport issue for the town and the scheme with potential to unlock the full benefits of the masterplan.

Key principles of the masterplan

The masterplan focuses on the following key place-making principles:

- greater pedestrian priority will establish increased footfall and economic activity;
- better provision for cycling will lead to increased accessibility from wider town;
- reduced vehicle impact will generate noise and air quality benefits for the town centre environment; and
- removal of road space will create increased land for prime waterside development.

The assessment of layout options for the gyratory has considered these key principles.

Scenario development

A wide range of options from various sources were developed for dialogue and testing. These include those suggested by the masterplan team as well as other scenarios suggested by Guildford Borough Council.

The options assessed largely fall into three categories – options with minor changes; options featuring major infrastructure such as bridges and tunnels; and options which seek to remodel the system within the existing urban form. These are described further in the masterplan report.

The options were discussed and agreed for testing with the Guildford Town Centre Highway Assessment (GoTCHA) study working group. The long list of options provided for testing is shown below.

1. Arup Concept 1 – Two-way, Bridge St 2 lanes.
2. Arup Concept 2 – Part Two-way, Bridge St 2 lanes.
3. Arup Concept 3 – Two-way, Town Bridge, Part Pedestrianised.
4. Vision Concept – Two-way, Pedestrianised Bridge St.
5. GVG Concept – GVG Bridge, Pedestrianised Bridge St and Onslow St.
6. GBC Concept 1 – Tunnel with surface running.
7. GBC Concept 2 – Tunnel and pedestrianised Friary Bridge.
8. GBC Concept 3 – GVG Bridge, Tunnel, widespread pedestrianisation.
9. GBC Concept 4 – Existing gyratory with Bridge St 2 lanes.
10. GBC Concept 5 – Roundabouts, Bridge Street pedestrianized.
11. GBC Concept 6 – Existing gyratory with traffic calming on Eastern side.
12. GBC Concept 7 – Existing gyratory with Bus Gate.

Testing of options

A preliminary assessment of the options was undertaken by the GOTCHA consultant. This is reported in a Technical Note¹.

In summary, the technical approach adopted follows first principles, utilising available traffic data for the gyratory area of the town centre road network and its immediate approaches, to undertake a spreadsheet-based traffic assignment exercise. The methodology follows a simplified approach which assumes zero traffic growth, and bases assessments on 2011 origin-destination data. The technical outputs summarised include morning and evening peak degrees of saturation (DoS), delay, and the number of vehicles in excess of capacity (>90% DoS).

The approach has limitations: the results do not take into account the interaction between the traffic / pedestrian crossing nodes, as such it is important that the results be used only as a preliminary testing to enable comparative assessment of options. However, the testing has enabled a rapid assessment of the relative performance of options to inform the town centre masterplan, in advance of more detailed assessment using microsimulation modelling that is being undertaken by the GOTCHA consultant.

Multi-criteria assessment

The testing of options fed into a multi-criteria assessment. The assessment was undertaken in the GOTCHA study² with inputs from the Masterplan team.

The elements assessed are listed below:

- Traffic impact;
- Core Townscape Impact;
- Wider Townscape Impact;
- Provision for Pedestrians;
- Provision for Cyclists;
- Provision for Buses;
- Riverside Access;
- Indicative Cost;
- Construction Timescales; and
- Third Party Land Requirement

Each criteria was scored using a -10 to +10 scoring scale to clearly indicate whether an option is better or worse than the existing situation.

The assessment table is provided in the appendix to this note.

Major infrastructure schemes (e.g. GVG bridge and town centre road tunnel) do not perform particularly well on traffic impacts, and perform poorly on deliverability (cost, timescales, third party land requirements).

The following table illustrates why a tunnel option would not solve the problems with the gyratory. Currently, there is no dominant individual movement through the gyratory, with traffic flows fairly even spread between Shalford Road, Portsmouth Road and Farnham Road. This means that major infrastructure solutions that address one movement through the gyratory have a limited benefit and would not justify major infrastructure.

¹ 'GOTCHA Technical Note 1: Assessment of the performance of preliminary highway options' (WSP Parsons Brinckerhoff, 11 September 2015).

² 'GOTCHA Technical Note 1: Assessment of the performance of preliminary highway options' (WSP Parsons Brinckerhoff, 11 September 2015).

Gyratory traffic flows (vehicles, morning peak hour 0800-0900)

From	To	Onslow St	North Street	A281 Millbrook	A3100 Portsmouth Road	Farnham Road	Walnut Tree Close	Totals
A322 Onslow St		0	42	354	380	338	93	1207
North Street		0	0	0	0	0	0	0
A281 Millbrook		285	8	0	31	308	165	797
A3100 Portsmouth Road		326	18	114	0	191	115	764
A31 Farnham Road		372	29	247	118	0	98	864
Walnut Tree Close		96	4	103	69	32	0	304
Totals		1079	101	818	598	869	471	3936

Source: Surrey County Council Guildford Registration Plate Survey (June 2011)

The best performing options from the assessment are:

3. Arup Concept 3 – Two-way, Town Bridge, Part Pedestrianised;
4. Vision Concept – Two-way, Pedestrianised Bridge St;
10. GBC Concept 5 – Roundabouts, Bridge Street pedestrianised;
11. GBC Concept 6 – Existing gyratory with traffic calming on Eastern side;
12. GBC Concept 7 – Existing gyratory with Bus Gate.

These options score significantly better on a number of criteria (e.g. pedestrians, cycles, buses, core townscape impact) and do not require major third party land take.

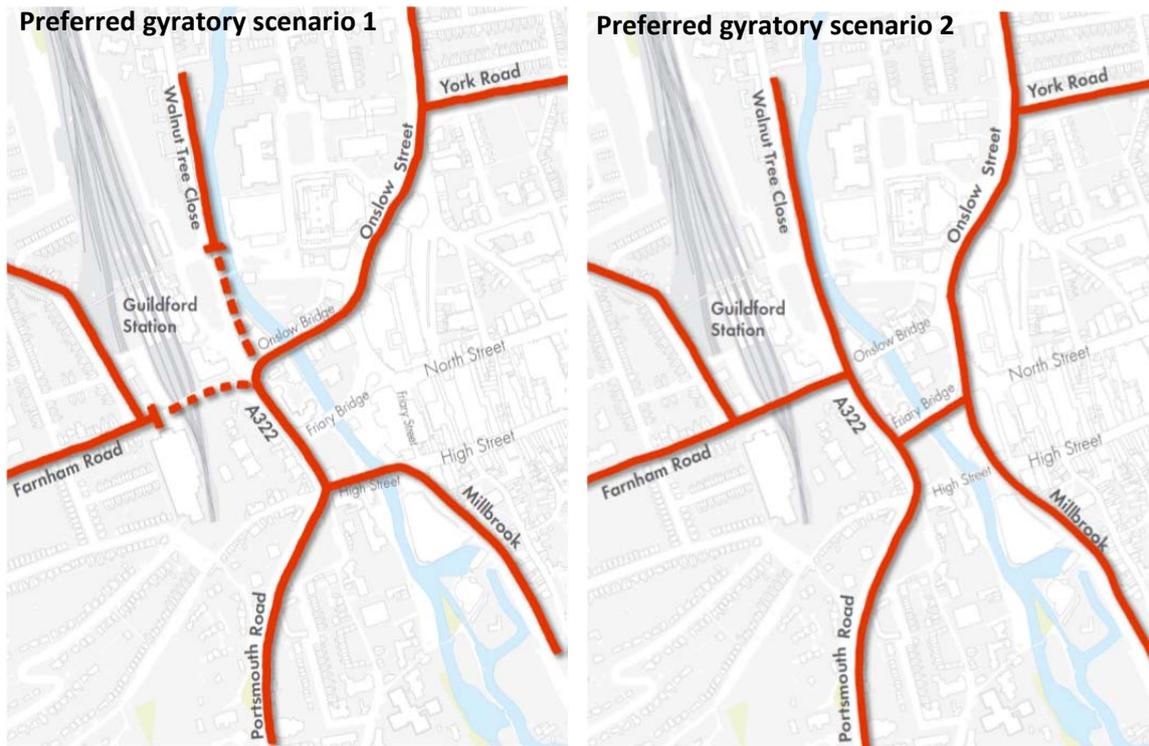
Of these top performing options, two of them do not fully enable the proposed Masterplan to be realised; these are: GBC Concept 6 – Existing gyratory with traffic calming on Eastern side and GBC Concept 7 – Existing gyratory with Bus Gate. This is because these options do not significantly change the configuration of the gyratory or open up riverside land for public open space and development.

GBC Concept 5 – Roundabouts, Bridge Street pedestrianized is similar to the Vision Concept, in terms of making the gyratory two-way and pedestrianizing Bridge Street. The only difference is roundabouts at the main junctions (in GBC Concept 5) compared with traffic signals (in Vision Concept). Roundabouts on the gyratory are not preferred by the Masterplan team as they can have a negative impact on vulnerable road users (i.e. pedestrians and cyclists)³ in an area where more walking and cycling is to be encouraged. The Vision Concept is therefore preferred to GBC Concept 5.

The remaining option is Arup Concept 3. This option is preferred because it reconfigures the gyratory and opens up riverside land for public open space and development. Both this and the Vision option fully support the Masterplan ambitions and are therefore selected as the preferred scenarios.

The preliminary assessment has been really useful in providing a relatively quick and high level review of options so they can be shortlisted for more detailed study.

³ Whilst having some advantages for traffic, roundabouts generally have a poor collision record for cyclists and can be a significant barrier to pedestrian movement. Many roundabout designs only make minimal provision for pedestrians, requiring them to cross wide entry and exit arms and people waiting to cross one of the arms may not be able to easily anticipate the movement of motor vehicles on the roundabout, or entering or leaving it [sources: 'Manual for Streets' (DfT, 2007) and 'Manual for Streets 2' (CIHT, 2010)].



Above: Preferred gyratory scenarios for the masterplan

Further development of the preferred scenarios

The preliminary assessment has indicated that the preferred scenarios would best support the objectives of the masterplan. They do however have impacts on the existing operation of traffic in the town centre, for example there is estimated to be:

- a significantly higher Degree of Saturation (i.e. over capacity) and more delay at the Farnham Road / Walnut Tree Close junction compared to the existing situation;
- a significantly higher Degree of Saturation at Onslow Street and more delay at the pedestrian crossing.

However, the assessment also showed that the GBC Concept 7 (Existing gyratory with Bus Gate), which would provide a bus gate during peak hours on the Farnham Road Bridge, significantly improves the performance of the gyratory.

With the assessment above, the transport impacts of the preferred scenarios are largely understood at a strategic level. However, detailed assessment and analysis is needed to understand the specific requirements to make these scenarios work in traffic terms. This includes both infrastructure requirements (i.e. road layout and junction configurations) and supporting measures (e.g. traffic reduction strategies).

It is anticipated that the preferred scenarios will be tested in the GOTCHA study using the microsimulation model currently being developed, and that this modelling will include traffic forecasts for a 'with town centre masterplan' scenario.

It is recommended that iterations of tests are undertaken to determine the optimum road layout and junction configuration to make the scenarios work to an acceptable level. Traffic reduction measures should also feed into these iterations, to ensure that the wider masterplan transport strategy is given consideration.

For example, a package of measures is proposed to reduce traffic on the gyratory with the masterplan. These include:

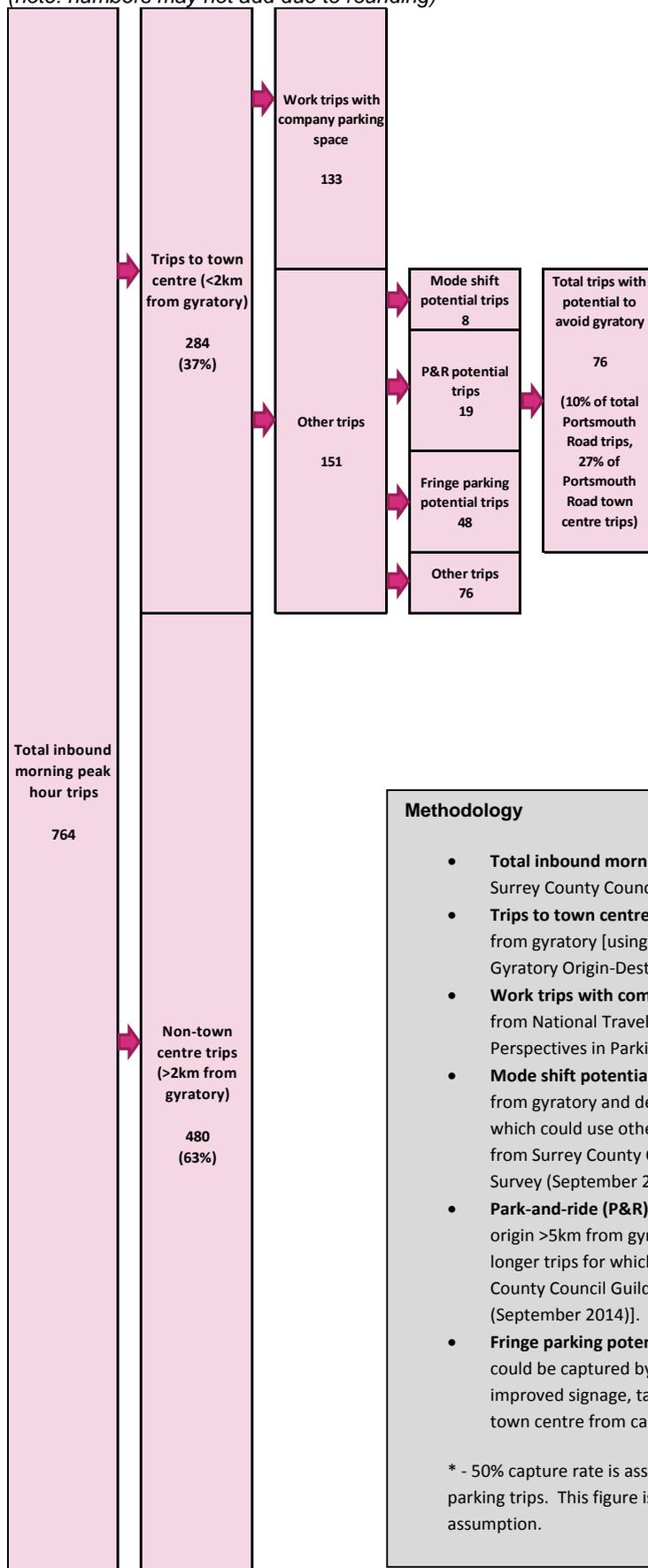
- strategic interventions to divert through traffic away from town centre (e.g. signage);
- interception of longer distance town centre trips at park-and-ride sites with bus priority measures for these services;
- the Sustainable Movement Corridor that has been adopted as a long term solution by Guildford Borough Council, which would further enhance access to the town centre by sustainable modes;
- interception of town centre trips at town centre fringe car parks;
- a car park pricing strategy to influence driver behaviour (e.g. park-and-ride lowest, central town centre highest with significant differential);
- high quality walking routes between car parks and town centre;
- a shuttle bus service between town centre and car parks – potentially funded by workplace parking charge on private non-residential spaces;
- other potential traffic circulation interventions such as the closure of Walnut Tree Close (north of the rail station) and/or the implementation of a bus gate at Farnham Road;
- a wider transport strategy to achieve a mode shift for intra-town trips; and
- cycle hire, 'park-and-glide' water transport service on the River Wey (subject to feasibility studies).

Many of these interventions are consistent with the recommendations of the Guildford Town and Approaches Movement Study (GTAMS) which completed in early 2015.

The following diagram illustrates a worked example of how traffic could potentially be reduced at the gyratory. Using actual survey data, it identifies the proportion of town centre trips on Portsmouth Road where there is potential to avoid the gyratory either through mode shift (of short intra-town trips), shift to park-and-ride (for longer distance trips), or diverting to car parks on the town centre fringe. This is estimated to achieve the removal of 76 vehicles (13%) from the gyratory on the A3100 Portsmouth Road arm in the peak hour. This is 27% of town centre trips on this approach. The same exercise for other arms indicates that traffic could be reduced by 8-17%.

This is a fairly conservative estimate as it only assumes 50% of potential trips would be captured and excludes any traffic reduction from removing non-town centre trips from the gyratory.

Illustration of potential traffic reduction through gyratory from Portsmouth Road (note: numbers may not add due to rounding)



Methodology

- **Total inbound morning peak hour trips** (vehicles, 0800-0900) [from Surrey County Council Guildford Registration Plate Survey (June 2011)].
- **Trips to town centre** defined as those which have a destination <2km from gyratory [using data from Surrey County Council Guildford Gyratory Origin-Destination Survey (September 2014)].
- **Work trips with company parking space** estimated using proportion from National Travel Survey data [from Table 3.5 'Spaced Out: Perspectives in Parking Policy' (RAC Foundation, July 2012)].
- **Mode shift potential trips** defined as 50%* of those with origin <3km from gyratory and destination <2km from gyratory (i.e. short trips which could use other modes such as walk, cycle or bus) [using data from Surrey County Council Guildford Gyratory Origin-Destination Survey (September 2014)].
- **Park-and-ride (P&R) potential trips** defined as 50%* of those with origin >5km from gyratory and destination <2km from gyratory (i.e. longer trips for which P&R could be an option) [using data from Surrey County Council Guildford Gyratory Origin-Destination Survey (September 2014)].
- **Fringe parking potential trips** estimated as 50%* of 'other trips' which could be captured by enhanced town centre fringe car parks assuming improved signage, targeted pricing and enhanced walking routes to town centre from car park.

* - 50% capture rate is assumed for potential mode shift, P&R and fringe parking trips. This figure is an estimate in the absence of data to inform this assumption.

Delivery of the transport strategy

The preferred scenarios identified in this note cannot be implemented overnight. They require detailed study of the traffic impacts and development of mitigation measures, particularly the traffic reduction measures recommended in the masterplan.

It is therefore recommended that a phased approach is taken to the delivery of the transport strategy. This is envisaged as a long-term package of enhancements which through incremental implementation would facilitate reductions in traffic, assisting in meeting the overall objectives of the masterplan. Potential phases include:

- **Phase 1:** implement supporting transport strategy measures (parking, mode shift, etc.);
- **Phase 2:** incremental changes to gyratory (e.g. remove lane from Bridge Street);
- **Phase 3:** step up supporting transport strategy measures;
- **Phase 4:** more radical changes to gyratory on temporary basis (e.g. Sunday events on Millbrook); and
- **Phase 5:** with full implementation of masterplan, make gyratory changes permanent.

Appendix: Assessment matrix

Assessment Summary from GOTCHA study ⁴															Total scores	
Option		Preliminary Traffic Impact Assessments			Multi-Criteria Qualitative Assessments (Significant Disbenefit -10 > Significant Beneficial +10)								Deliverability (Significant Costs, timescales or third party land requirements -10 > Lower costs, shorter timescales and limited third party land requirements 0)			
Number	Description	Averaged DoS Increase (all Nodes) [1]	Delay Difference (PCU/Hr) [2]	Traffic Reduction Requirement [3]	Traffic Impact	Core Townscape Impact	Wider Townscape Impact	Provision for Pedestrians	Provision for Cyclists	Provision for Buses	Riverside Access	Indicative Cost	Construction Timescale	Third Party Land Requirement		
1	Arup Concept 1 – Two-way, Bridge St 2 lanes	20%	556	1048	24%	-2	+1	0	+2	+1	-1	0	-2	-2	0	-3
2	Arup Concept 2 – Part Two-way, Bridge St 2 lanes	13%	449	1008	23%	-2	+1	0	+2	+1	-1	0	-2	-2	0	-3
3	Arup Concept 3 – Two-way, Town Bridge, Part Pedestrianised	107%	2288	2485	57%	-10	+7	0	+8	+8	-10	+7	-3	-4	-2	1
4	Vision Concept – Two-way, Pedestrianised Bridge St	87%	1685	1891	44%	-9	+6	0	+8	+7	-7	+3	-2	-3	0	3
5	GVG Concept – GVG Bridge, Pedestrianised Bridge St and Onslow St	30%	486	1117	26%	-3	+7	-6	+8	+6	-2	+5	-7	-8	-10	-10
6	GBC Concept 1 – Tunnel with surface running	22%	172	463	11%	-3	+2	0	+3	+1	-1	+2	-5	-7	-2	-10
7	GBC Concept 2 – Tunnel and pedestrianised Friary Bridge	106%	1310	2203	51%	-10	+7	0	+7	+6	-10	+8	-5	-8	-2	-7
8	GBC Concept 3 – GVG Bridge, Tunnel, widespread pedestrianisation	38%	224	623	14%	-4	+10	-6	+10	+9	-3	+10	-10	-10	-10	-4
9	GBC Concept 4 – Existing gyratory with Bridge St 2 lanes	1%	0	46	1%	-1	+1	0	+2	+1	-1	0	-1	-1	0	0
10	GBC Concept 5 – Roundabouts, Bridge Street pedestrianised	18%	-9	39	1%	-2	+3	0	+3	+2	0	+2	-3	-4	0	1
11	GBC Concept 6 – Existing gyratory with traffic calming on Eastern side	30%	554	1047	24%	-3	+2	0	+4	+3	-3	+1	-1	-1	0	2
12	GBC Concept 7 – Existing gyratory with Bus Gate	-24%	-41	0	0%	+3	+1	-2	+2	+2	+4	0	-1	-2	0	7

[1] Combined Average for AM and PM Peaks
 [2] AM Peak (Delay for Existing Layout Nodes in the AM Peak is 66 pcus/hr)
 [3] Whichever is the highest of either all approaches to existing gyratory area or worst performing junction, AM Peak, % figures reflect the traffic reduction required as a proportion of traffic flows into the gyratory or junction as appropriate

⁴ Table 28 - 'GOTCHA Technical Note 1: Assessment of the performance of preliminary highway options' (WSP Parsons Brinckerhoff, 11 September 2015).