

Highways Technical Report

Site: Worcester Close, Gravesend
Prepared by: HM
Approved by: DM
Date: 20 January 2023

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1.0 Introduction

- 1.1 Motion is instructed by Frankham Projects to prepare this Highways Technical Note to support a planning application for a residential development on land adjacent to Worcester Close, in a village known as Instead Rise near Gravesend, Kent (herein referred to as 'the site').
- 1.2 The site is located adjacent to Worcester close, approximately 230 metres from the centre of Instead Rise. The A227 is 500 metres from the site, which provides access to Gravesend Town Centre 3 kilometres away. The site falls within the administrative boundary of Kent County Council and the borough of Gravesham.
- 1.3 The proposal seeks planning permission for the construction of eight residential flats with associated vehicle access and parking. There is no existing above ground structure on site. Access will be achieved from Worcester Close via a new access junction.

2.0 Site Context

- 2.1 The site lies on the western side of Worcester Close, approximately 3 kilometres from Gravesend Town Centre. The location of the site is shown in Figure 2.1 below. Local facilities within Istead Rise can be accessed within a short walk distance along dedicated footways, as described later in this section.



Figure 2.1 – Site Location Plan

Accessibility by Non-Car Modes

Accessibility by Foot and by Cycle

- 2.2 There is a footway on the eastern side of Worcester Close, with a bridleway running alongside the western edge of the site extending north past the Istead Rise Community Centre Field to Northfleet.
- 2.3 The roads surrounding the site are cycle friendly, with low speed limits and flat terrain. Alongside the A227 is a bike trail and footpath that connects the site to Gravesend Town Centre via a 20-minute cycle.

Accessibility by Bus

- 2.4 As illustrated in Figure 2.1 the closest bus stop is located 220 metres south of the site on Istead Rise. This stop services a number of routes, with the destinations served and frequency of services highlighted in Table 2.1 below.

Service Number	Route	Approximate Frequency		
		Mon-Fri	Saturday	Sunday
306	Bluewater Bus Station - Sevenoaks Bus Station	7 times daily	Every hour in the evening	N/A
308	Gravesend - Sevenoaks	Every hour	Every 1.5 hours	N/A

Table 2.1 – Local Bus Services

Accessibility by Rail

- 2.5 Meopham train station is the closest railway station, which is located approximately 2.8 kilometres south of the site, this equates to a 34 minute walk or a 9 minute-minute cycle. Meopham Station has services to London Victoria, Dover Priory, Gillingham (Kent), and Ramsgate.

Accessibility to Key Facilities

- 2.6 The site is located approximately 230 metres from Instead village centre, containing a variety of local amenities. These facilities and their distances are summarised in Table 2.2 below.

Facility	Distance from site (m)	Walking distance (minutes)	Cycle distance (minutes)
Downs Way Medical Practice	75	1	1
Instead Rise Community Centre	135	1	1
Instead Convenience Store	150	2	1
Instead Rise Pharmacy	150	2	1
Co-op Food	190	3	1
Dental Surgeon	330	4	1
Montessori Group Preschool	350	4	1
Primary School	800	11	3

Table 2.2 – Local Facilities and Services

- 2.7 Further local amenities in Gravesend can be accessed via bus or cycle. Many of the local bus services also provide connection to a variety of local schools.

Summary

- 2.8 In summary, the site has very good level of accessibility by public transport, on foot and by cycle. The sites' location means that everyday local amenities can be accessed easily by foot or cycle.

3.0 Development Proposals

3.1 The proposals seek planning permission for the construction of eight residential flats consisting of the following mix:

- ▶ 4x one-bed units; and
- ▶ 4x two-bed units.

3.2 The architect's site layout plan is attached as **Appendix A**.

Access Arrangements

3.3 Vehicular and pedestrian access to the site will be from Worcester Close via a new access junction.

3.4 Visibility splays are shown on the drawing attached as **Appendix B**, which extend to 43 metres in both directions to reflect the 30mph speed limit. The trees at the southern end of the site can be preserved as they do not hinder visibility. The above is considered robust, as vehicle speeds are considered likely to be below the observed speed limit.

Car Parking Provision

3.5 KCC guidance provides expected levels of car parking to be provided at residential development based on dwelling size and location of development. The proposed development is in a suburban edge/village/rural location, containing 4x one-bedroom and 4x two-bedroom flats. This indicates the need for a minimum of eight car parking spaces (one per flat). Car parking will be provided on-site with 10 spaces, which ensures sufficient car parking for both residents and visitors. The above guidance suggests a provision of 0.2 visitor spaces per unit, which when rounded up is two spaces.

3.6 Swept path analysis of a large car is contained within **Appendix C**, which demonstrates that key parking spaces can be suitable accessed with the car departing in forward gear.

3.7 Suitable levels of electric charging will be incorporated into the development. It is proposed that all eight resident car parking spaces will benefit from an active charging point, with the remaining two visitor spaces benefitting from passive charging provision.

3.8 KCC guidance on cycle parking requires the provision of one space for every flat. Based on the aforementioned housing mix, it is proposed to incorporate secure cycle shelters to accommodate eight spaces. As shown on the aforementioned site layout plan, secure facilities are provided in appropriate locations on site.

Servicing and Refuse Collection

3.9 Servicing and refuse collection will be undertaken on-street via Worcester Close. The proximity of the units to the highway will require a fire appliance to reverse into the access junction from Worcester Close. Building regulations allows for a fire appliance to reverse a maximum of 20 metres, which would ensure a fire appliance can reach each dwelling within a 45 metre hose drag distance.

3.10 Bin stores will be located within the car park in close proximity of the highway to avoid the need for the refuse collection vehicle to physically enter the site.

4.0 Trip Generation

- 4.1 This section outlines the level of trips that are likely to be generated by the proposed development. When assessing the impacts of a residential development, it is generally considered that the peak traffic times are weekday mornings (08:00-09:00) and weekday evenings (17:00-18:00). It is during these periods that traffic flows associated with the development and those on the adjacent highway network are likely to be at their greatest. The information provided within this section considers these peak hours as well as the daily movements (07:00-19:00).
- 4.2 To calculate the trip attraction potential of four flats at the site, an assessment utilising the TRICS database has been undertaken. The TRICS category '03 Residential: K – Mixed Priv Houses (Flats and Houses)' has been used, with the following criteria:
- ▶ Sites located in England, excluding Greater London;
 - ▶ Sites with up to 30 dwellings; and
 - ▶ Sites in areas classed as edge of town or suburban area.
- 4.3 A summary of the peak hour total person and vehicular trip rates are provided in Table 4.1 below and the full TRICS output included at [Appendix D](#).

Mode of Travel	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)		Weekday Daily Movements	
	Arr	Dep	Arr	Dep	Arr	Dep
Total Person Trip Rates	0.070	0.352	0.282	0.127	3.001	3.241
Total Person Trips	1	3	2	1	24	26
Vehicular Trip Rates	0.056	0.141	0.197	0.085	1.664	1.664
Vehicular Trips	1	1	2	1	13	13

Table 4.1 – Proposed Trip rates and Resultant Trips

- 4.4 Table 4.1 indicates that the proposed dwellings could generate four total person trip in the weekday morning peak hour, with two vehicle trips. In the evening peak hour, the dwellings could generate three total person trips, of which all would be vehicular trips. Over an average weekday, the dwellings could generate 50 two-way total person trips, of which 26 could be vehicular
- 4.5 It is clear from the above assessment that the proposal will result in a negligible increase in trips to the site, both in terms of total trips and vehicular trips during the established peak periods and over a daily profile.

5.0 Conclusion

- 5.1 In view of the above, the proposed development is considered to be acceptable in transport terms and meets with local and national policy criteria. The assessment work undertaken has shown that there would not be any demonstrable harm arising from the proposed scheme and it will not cause any severe impacts. Therefore, there are no traffic and transport related reasons why the development should not be granted planning consent.

Appendix A

Architect's Site Layout Plan



Key

- Proposed Tree
- Retained Tree

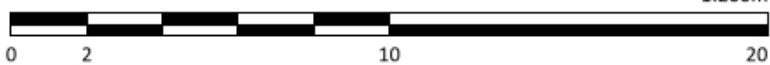
Notes:
Do not scale. All dimensions are in millimetres unless otherwise stated. This drawing should be read in conjunction with all relevant project information and contract documentation. All dimensions to be checked prior to fabrication and or commencement of works. All works to comply with all relevant legal standards, building regulations and warranty provider requirements. Report any discrepancies, if in doubt ask.

Revisions:	Rev	Status	Date	Description	Dwn	Chkd
P01	S3	10.11.12	Preliminary Issue	HLB		
P02	S3	15.12.22	RIBA Stage 3 Design Freeze / Draft Planning Issue	HLB	AA	

Client Name: Gravesham Borough Council			
Project Name: 20-102 Worchester Close			
Drawing Name: Proposed Block Plan			
Drawing Number: WCL-BPTW-S01-ZZ-DR-A-0112		Rev: P02	Status: S3
Project No: 20-102	RIBA Stage: 3	Drawn By: HLB	Scale: 1:200 @ A1

PRELIMINARY - FOR COMMENT

40 Norman Road,
Greenwich, London
SE10 9QX
t 020 8293 5175
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Note:
Existing context based on Ordnance Survey data, Topographical Survey and Arboriculture Survey (by others).
Landscape design is illustrative of design intent only.
Size, location and orientation of ASHP (including acoustic enclosure) and PV Panels subject to detailed design.



Note:
Existing context based on Ordnance Survey data, Topographical Survey and Arboriculture Survey (by others).
Landscape design is illustrative of design intent only.
Size, location and orientation of ASHP (including acoustic enclosure) and PV Panels subject to detailed design.

Key

1B2P

2B3P

2B4P

Proposed Tree

Retained Tree



Key Plan

Notes:
Do not scale. All dimensions are in millimetres unless otherwise stated. This drawing should be read in conjunction with all relevant project information and contract documentation. All dimensions to be checked prior to fabrication and/or commencement of works. All works to comply with all relevant legal standards, building regulations and warranty provider requirements. Report any discrepancies, if in doubt ask.

Rev	Status	Date	Description	Drn	Chkd
P01	S3	15.12.22	RIBA Stage 3 Design Freeze / Draft Planning Issue	HLB	AA

Client Name: Gravesham Borough Council					
Project Name: 20-102 Worcester Close					
Drawing Name: Ground Floor Plan					
Drawing Number: WCL-BPTW-S01-00-DR-A-1001				Rev: P01	Status: S3
Project No: 20-102	RIBA Stage: 3	Drawn By: HLB	Scale: 1:100 @ A2		

PRELIMINARY - FOR COMMENT

40 Norman Road,
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1:100m



Appendix B

Visibility Splays at the Site Access



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Project:
Worcester Close, Gravesend

Title:
Visibility Splay

Scale: 1:500 (@ A3)

Drawing:
2208032-01

Revision:
A

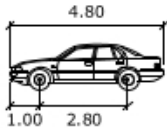


Appendix C

Swept Path Analysis – Large Car



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VOITURE-G	
	parameters
Width	1.80 meters
Track	1.75
Lock to Lock Time	6.0
Steering Angle	35.9



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Project:
Worcester Close, Gravesend

Title:
Swept Path Analysis
Car

Scale: 1:250 (@ A3)

Drawing:
2208032-TK01

Revision:
A

Appendix D

TRICS Output

Calculation Reference: AUDIT-734001-220920-0909

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : K - MIXED PRIV HOUS (FLATS AND HOUSES)

MULTI-MODAL TOTAL VEHICLESSelected regions and areas:

06 WEST MIDLANDS	
ST STAFFORDSHIRE	1 days
09 NORTH	
CB CUMBRIA	1 days
TW TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: No of Dwellings
 Actual Range: 15 to 28 (units:)
 Range Selected by User: 15 to 30 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/14 to 15/10/21

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	1 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	3 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	2

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	2
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:Use Class:

C3 3 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Population within 1 mile:

15,001 to 20,000 2 days

25,001 to 50,000 1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000 1 days

125,001 to 250,000 1 days

250,001 to 500,000 1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0 1 days

1.1 to 1.5 2 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No 3 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present 3 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	CB-03-K-02	SEMI-DETACHED & FLATS	CUMBRIA
	NATLAND ROAD KENDAL		
	Suburban Area (PPS6 Out of Centre) Residential Zone		
	Total No of Dwellings:	15	
	Survey date: TUESDAY	21/06/16	Survey Type: MANUAL
2	ST-03-K-03	MIXED HOUSING & FLATS	STAFFORDSHIRE
	CLAREMONT ROAD WOLVERHAMPTON		
	Suburban Area (PPS6 Out of Centre) Residential Zone		
	Total No of Dwellings:	28	
	Survey date: FRIDAY	09/05/14	Survey Type: MANUAL
3	TW-03-K-02	FLATS & TOWN HOUSES	TYNE & WEAR
	TYNEMOUTH ROAD TYNEMOUTH		
	Edge of Town Centre No Sub Category		
	Total No of Dwellings:	28	
	Survey date: FRIDAY	15/10/21	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

Motion High Street Guildford

Licence No: 734001

TRIP RATE for Land Use 03 - RESIDENTIAL/K - MIXED PRIV HOUS (FLATS AND HOUSES)

MULTI-MODAL TOTAL VEHICLES**Calculation factor: 1 DWELLS****BOLD print indicates peak (busiest) period**

Total People to Total Vehicles ratio (all time periods and directions): 1.88

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	24	0.113	3	24	0.113	3	24	0.226
08:00 - 09:00	3	24	0.056	3	24	0.141	3	24	0.197
09:00 - 10:00	3	24	0.113	3	24	0.099	3	24	0.212
10:00 - 11:00	3	24	0.099	3	24	0.155	3	24	0.254
11:00 - 12:00	3	24	0.296	3	24	0.141	3	24	0.437
12:00 - 13:00	3	24	0.155	3	24	0.211	3	24	0.366
13:00 - 14:00	3	24	0.099	3	24	0.085	3	24	0.184
14:00 - 15:00	3	24	0.127	3	24	0.197	3	24	0.324
15:00 - 16:00	3	24	0.155	3	24	0.141	3	24	0.296
16:00 - 17:00	3	24	0.169	3	24	0.141	3	24	0.310
17:00 - 18:00	3	24	0.197	3	24	0.085	3	24	0.282
18:00 - 19:00	3	24	0.085	3	24	0.155	3	24	0.240
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.664			1.664			3.328

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

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Parameter summary

Trip rate parameter range selected:	15 - 28 (units:)
Survey date range:	01/01/14 - 15/10/21
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Motion High Street Guildford

Licence No: 734001

TRIP RATE for Land Use 03 - RESIDENTIAL/K - MIXED PRIV HOUS (FLATS AND HOUSES)

MULTI-MODAL TOTAL PEOPLE**Calculation factor: 1 DWELLS****BOLD print indicates peak (busiest) period**

Total People to Total Vehicles ratio (all time periods and directions): 1.88

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	24	0.211	3	24	0.254	3	24	0.465
08:00 - 09:00	3	24	0.070	3	24	0.352	3	24	0.422
09:00 - 10:00	3	24	0.239	3	24	0.282	3	24	0.521
10:00 - 11:00	3	24	0.183	3	24	0.282	3	24	0.465
11:00 - 12:00	3	24	0.451	3	24	0.296	3	24	0.747
12:00 - 13:00	3	24	0.310	3	24	0.324	3	24	0.634
13:00 - 14:00	3	24	0.141	3	24	0.183	3	24	0.324
14:00 - 15:00	3	24	0.254	3	24	0.324	3	24	0.578
15:00 - 16:00	3	24	0.423	3	24	0.211	3	24	0.634
16:00 - 17:00	3	24	0.268	3	24	0.282	3	24	0.550
17:00 - 18:00	3	24	0.282	3	24	0.127	3	24	0.409
18:00 - 19:00	3	24	0.169	3	24	0.324	3	24	0.493
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.001			3.241			6.242

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.