



Strood Waterfront Regeneration

Transport Statement

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Executive Summary

IBI Group was commissioned by the Regeneration Team of Medway Council to update the adopted 2006 Strood Riverside Development Brief, which was extended to include the Civic Centre site. It was recognised that the development brief is influenced by a number of factors including the interaction between viability (cost/benefit), site capacity, planning and housing policy, and transport capacity issues. This report, in the form of a Transport Statement, seeks to address the transport capacity issues with a view to informing the overall design process.

The key insights gained during the study are:

- Accesses for the proposed development have light traffic and are under capacity currently. The surrounding road network is congested during peak hours;
- The proposed development will need to rely heavily on sustainable modes of transport. Current policies and best practice encourage and support this;
- Residents living in close proximity to a train station have lower levels of car ownership and tend make fewer trips by car or van. In combination with progressive parking standards, lower parking provision rates are justified. Emerging trends and technologies can be used to further lower parking provision;
- Given that Strood Town Centre is generally congested and junctions operate at capacity, any additional traffic would result in further congestion. At this time, a future baseline which accounts for the benefits of committed infrastructure improvements cannot be established. Consequently, analysis of the future base scenario with development traffic cannot be analysed; and
- The combination of committed infrastructure improvements (in-flight initiatives), justified lower parking standards and modal shift to sustainable modes of transports and the proposed measures, could potentially allow the road network to accommodate the proposed development.

To minimise the impact of the development a number of mitigation measures have been put forward for consideration, these include:

a. Council-wide Suggested Initiatives

Overall Strategic Transport Plan	Developing an integrated strategic plan to take account of strategic capacity considerations and the optimal use of current assets. The Council has commissioned a Strategic Transport Assessment (STA) to evaluate the existing context and determine the transport implications of future developments. Other specific council-wide initiatives supporting the strategic transport plan are outlined below.
Enhancement of Sustainable Modes	Bus routing and headways should be further investigated, discussion with train operators regarding frequency should be held, with bike share schemes to be revisited to encourage public transport usage.
Parking Strategy Planning	The transformation of urban Medway into a modern waterfront University City with greater land use intensity necessitates the development of robust, context sensitive parking standards that align with transportation and development objectives.
Travel Behaviour for Travel Demand Management	Use a combination of marketing and communication strategies, improved use of information technology, and the better use of existing or new channels to reach customers to elicit travel behaviour change. The proposition should be adapted to distinct traveller user groups.

b. Suggested Initiatives to be Implemented around the Site Area

Timeslots for Business Deliveries	Scheduled business deliveries and pick-ups within time slots can mitigate the impact of parked vehicles along high street.
Expansion of Traffic Monitoring	The ability to view traffic conditions is vital to successful traffic management. Expanded CCTV coverage is necessary to cover blind spots that will become important traffic corridors.
Traffic Signal Control System	Signal and pavement changes mean that the SCOOT system will need to be updated, recalibrated, and potentially expanded to accommodate growing traffic volumes and ensure efficient traffic flow within Strood.
Parking Guidance	Parking guidance could be enhanced to reduce circling and maximise parking assets through technology (parking rental platforms, parking sensors, cashless payments, and better wayfinding).
Electric Charging Points	Electric charging points should be provided around the area for hybrid and electric vehicles (low or zero emission) to help maintain high air quality.
Junction Modifications	<ol style="list-style-type: none"> 1. Conversion of Esplanade to a one-way relief road. 2. Signalising the Knight Road / Access junction, or banning right-turning traffic. 3. Removal of pavements and relocation of pedestrian access to convert Access Road leading to Knight Road into a two lane roadway. 4. Operating Right-out only at the High Street / Canal Road / Esplanade junction.
Car Club Schemes	The introduction of car club schemes to minimise the amount of parking provision at the development site

c. Suggested Site Specific Strategies

Access and Car Parking Location	Vehicular access to the Riverside development can be divided so that the western section of Riverside and Kingswear Gardens are accessed via the High Street and the eastern section of Riverside is accessed via Commissioner's Road. This will prevent commuters from Medway City Estate from 'rat-running' through the development site, thereby limiting impacts to the High Street / Canal Road / Esplanade intersection.
Further Traffic Data Analysis	Further Origin Destination data should be reviewed for all trip types to ensure a thorough analysis. The proximity of the potential development to local amenities may see the proportion of car or van trips reduced due to journeys made on foot; ultimately lowering the expected number of additional vehicles and impact on the network.
Cycle Share Scheme	An agreed cycle share scheme can be established with bicycle parking stations in visible public locations at the former Civic Centre and Riverside sites.

In summary, there is no single measure that will be able to solve the existing transport issues or those generated as a result of this new development. The solution is dependent on numerous individual measures and improvements across the Medway Towns, the area and site specific.

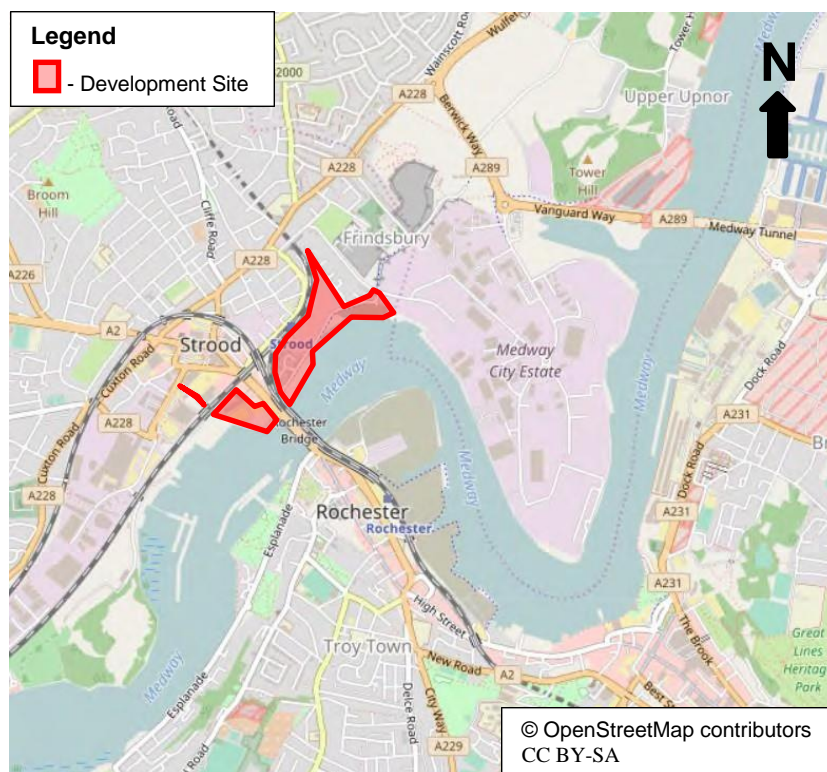
1 Introduction

1.1 Background

IBI Group was commissioned by the Regeneration Team of Medway Council to update the adopted 2006 Strood Riverside Development Brief, which was extended to include the Civic Centre site. This Transport Statement follows the updated Development Brief in providing context of the transport needs for the site.

The Strood Waterfront Regeneration project is a high quality residential development on a riverside location with excellent public transport accessibility and proximity to the town centre. The development covers two locations, the Civic Centre west of High Street and Strood Riverside east of High Street, as illustrated in Figure 1. The east location development is composed of 1,150 units, with an estimated additional 500 units in the location of the existing Kingswear Gardens. The west location development is a development of 525 units. There are currently plans for a portion of the development to be affordable housing.

Figure 1: Site Location



This new development is seen to be imperative to the regeneration of the wider Medway Waterfront and in helping to secure considerable private sector investment in the area. This development is also a vital and complementary component to other high profile regeneration projects elsewhere within Medway and, through early delivery, it is envisaged that the site will set the parameters for good quality urban design and architecture.

1.2 Scope

A Transport Statement, over a Transport Assessment, was chosen as part of this planning development framework stage given the nature of the development, current phase, and timescale. The Transport Statement provides further information in the following chapters:

- Existing Site and Proposed Development (Chapter 2) – Characteristics of the existing land use and of the proposed development;

- Existing Travel Network (Chapter 3) – Characteristics of the local travel network;
- Existing Conditions (Chapter 4) – Detail of the existing travel network and conditions based on the review of background developments and initiatives in the area;
- Background Developments (Chapter 5) – Providing context of developments in the area and current / expected traffic network operations;
- Relevant Policies (Chapter 6) – Understanding local and regional transport goals;
- Relevant In-flight Initiatives (Chapter 7) – Review of infrastructure improvements that are expected to encourage a modal shift, resulting in lower background traffic demand, and improving capacity of junctions;
- Parking Provision (Chapter 8) – Understanding local and regional parking standards and best practices that have pushed the lower boundary of parking standards to promote and achieve sustainable transport;
- Trip Generation and Distribution (Chapter 9) – An approximation of the number of site trips and their distribution along the road network;
- Mitigation Measures (Chapter 10) – Measures that could be used to reduce the impact of vehicle trips associated with the development;
- Impact on the Travel Network (Chapter 11) – A discussion of the impact of the development on the surrounding travel network;
- Conclusions (Chapter 12) – Summarise key findings; and
- Recommendations (Chapter 13) – As the planning phases, infrastructure improvements, and other in-flight initiatives progress, consideration should be given to completing a full Transport Assessment to understand the impact of the development on the travel network. This section outlines the steps that would be undertaken in carrying out such an assessment and further steps to be taken to progress the potential development.

It is critical to understand that this Transport Statement is to form the policy for which developments at this site will follow and is not intended to serve as the Transport Statement or Transport Assessment for planning application.

2 Description of Existing Site and Proposed Development

To set the context of the development, this chapter details the existing site, size and purpose of the proposed site, and the accessibility of the site at a local and regional scale.

2.1 Existing Site Information

This subsection gives context to the existing site and its location as well as the travel network that surrounds the site area.

2.1.1 Site Location

The site itself is positioned directly adjacent to the River Medway and is located within 5 to 10 minutes walking distance of Strood Town Centre, and 10 to 15 minutes walking distance from Rochester. The site includes a mainline railway station within its boundaries.

2.1.2 Site Transport Links

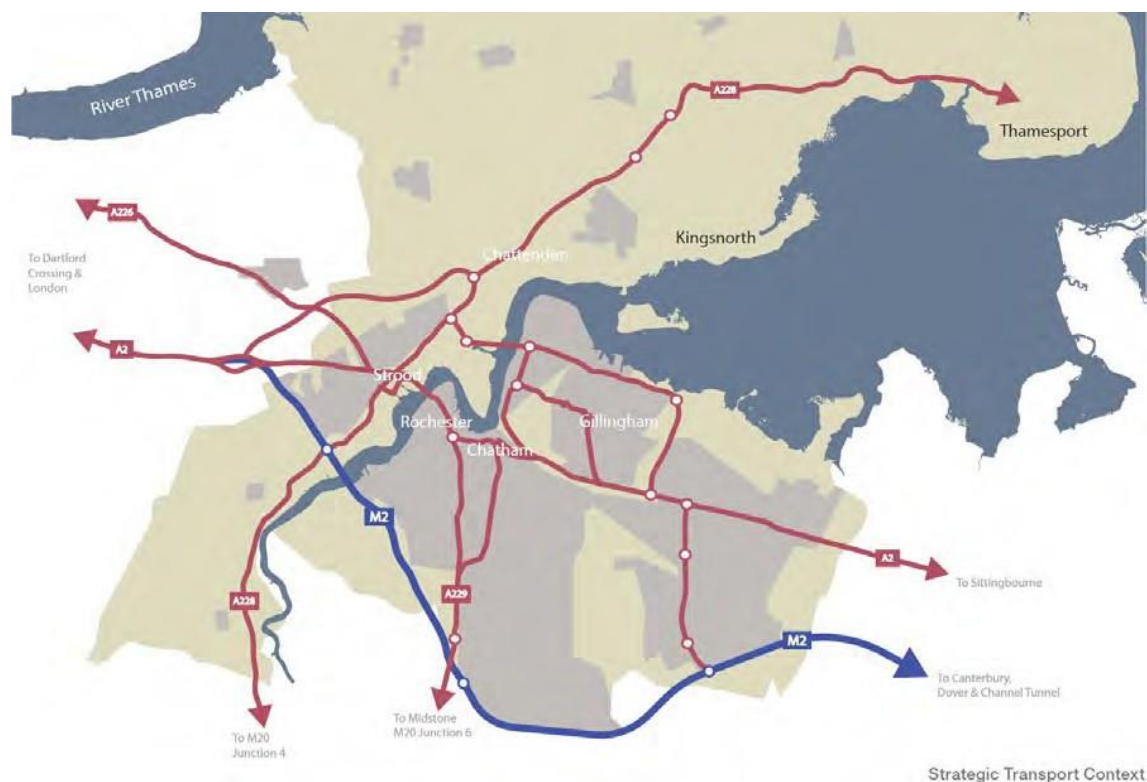
The site has excellent transport links as illustrated in Figure 2. It is well placed for access to:

- The M20 with access to Ashford International and the M25 London Orbital; and
- The Channel Tunnel Rail Link (CTRL) will provide new domestic services for Medway to London via the North Kent line's junction with the CTRL at Ebbsfleet.

At the local level, Strood Town Centre acts as a hub for three major roads:

- The A228 to Grain to the north and the M2 motorway and West Malling to the south;
- The A2 giving access to London and the M25 to the west and Rochester to the east; and
- The A226 to Gravesend.

Figure 2: Site Transport Links

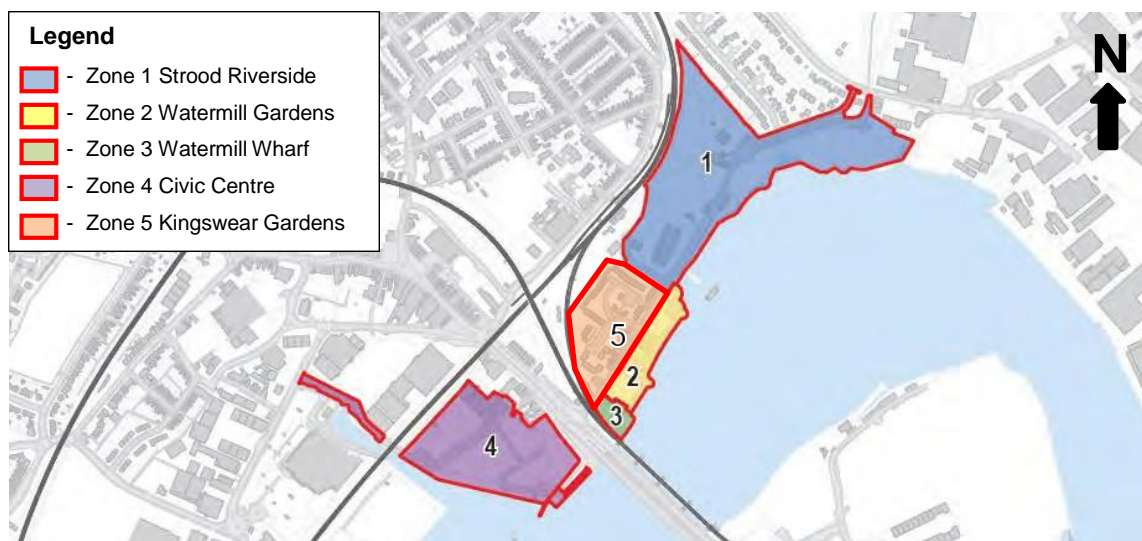


2.1.3 Existing Site Use

Strood Waterfront is a brownfield development site lying adjacent to the River Medway and within walking distance of the town centre. The site is divided into two distinct parts, the eastern waterfront and the former Civic Centre site to the west. The masterplan site is bounded by the River Medway to the south, by the operational railway lines to the west, by the Medway City industrial estate to the east and by residential land around Cranmere Court to the north.

The masterplan area, excluding the existing housing development at Kingswear Gardens and Crescent House Foyer, includes a total developable area of 10.25 hectares. The existing site is divisible into five distinct areas as illustrated in Figure 3.

Figure 3: Existing Site Use



The different areas are further discussed below:

ZONE ONE: STROOD RIVERSIDE

Along Canal Road are currently scrap yards, motor workshops, chemical mixing firms, historically occupied by railway marshalling yards, transport storage depots, builder's merchants, and storage operators.

The riverside frontages include a landscape park opposite Kingswear Gardens, Strood Pier, the Riverside Tavern, industrial buildings and a grassed area situated above the tidal shoreline.

ZONE TWO: WATERMILL GARDENS

Watermill Gardens is the strip of land adjacent to Watermill Wharf situated on the edge of the river and is currently owned by Medway Council with some spaces leased from Peel Ports. These are currently on an 80 year lease and may remain as public realm or open space as part of the masterplan developing upon subsequent negotiations. This area also includes the landscaped area providing children's facilities.

ZONE THREE: WATERMILL WHARF

Watermill Wharf is a brownfield site owned by Medway Council being developed to deliver 15 business units and storage units aimed at local SMEs and start-up businesses. Occupation is expected to begin April 2017.

ZONE FOUR: CIVIC CENTRE

The Civic Centre is dominated by a large car park and delivery and servicing area which service Medway Council buildings. The area lies behind a small number of local high street shops.

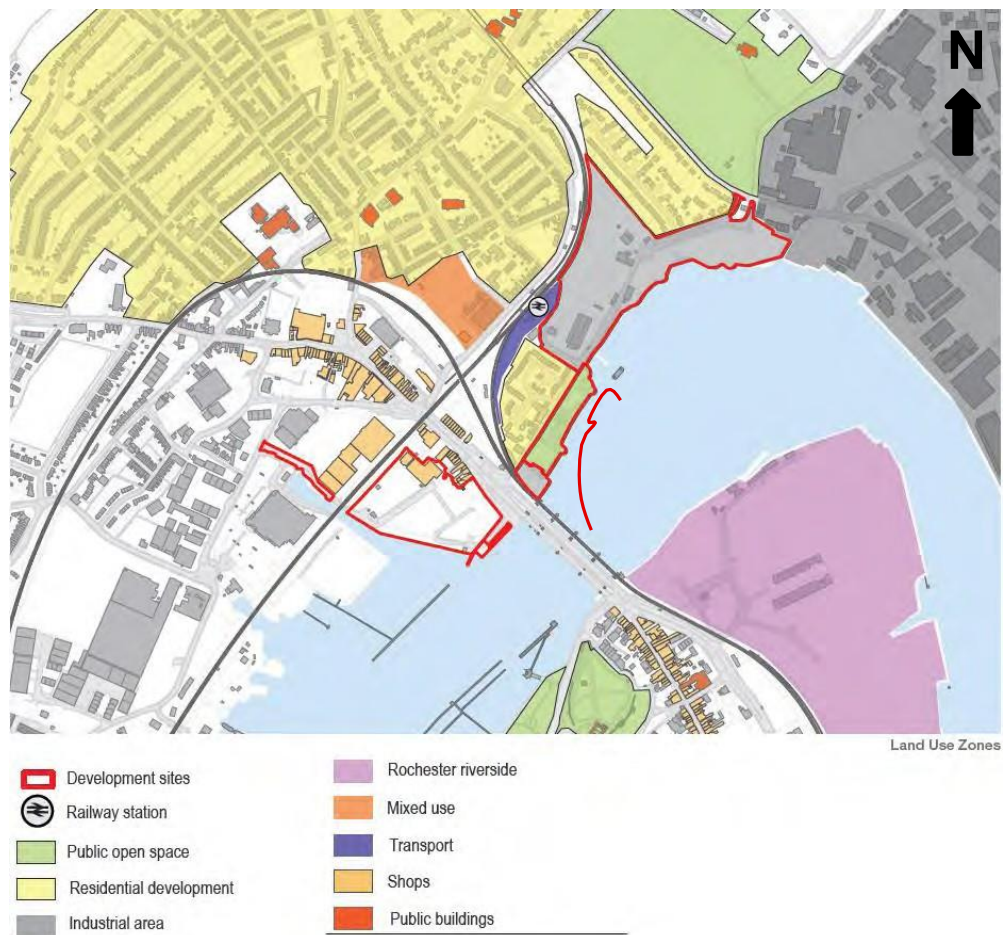
ZONE FIVE: KINGSWEAR GARDENS

Kingswear Gardens is currently a residential housing development just to the north of Canal Road and east of High Street and is adjacent to the railway station.

2.1.4 Adjacent Site Uses

The primary land uses in the vicinity of the site, illustrated in Figure 4, are retail, leisure, residential, industrial, office (Civic Centre site), and transport.

Figure 4: Land Uses within Adjacent to Site



2.1.5 Site Access

The following explores the existing situation in further detail in respect of the various movement types, as illustrated in Figure 5. A description of the different site accesses can be found in Table 1.

Figure 5: Access to Site

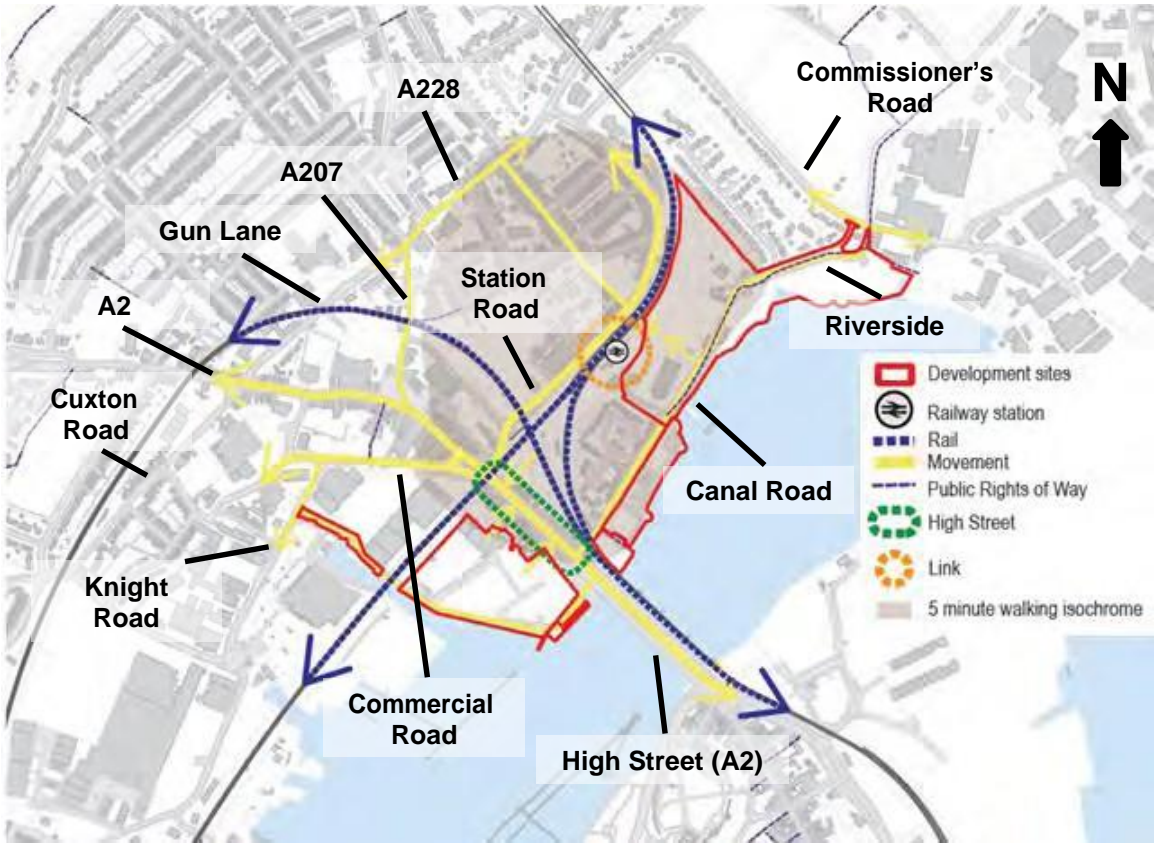


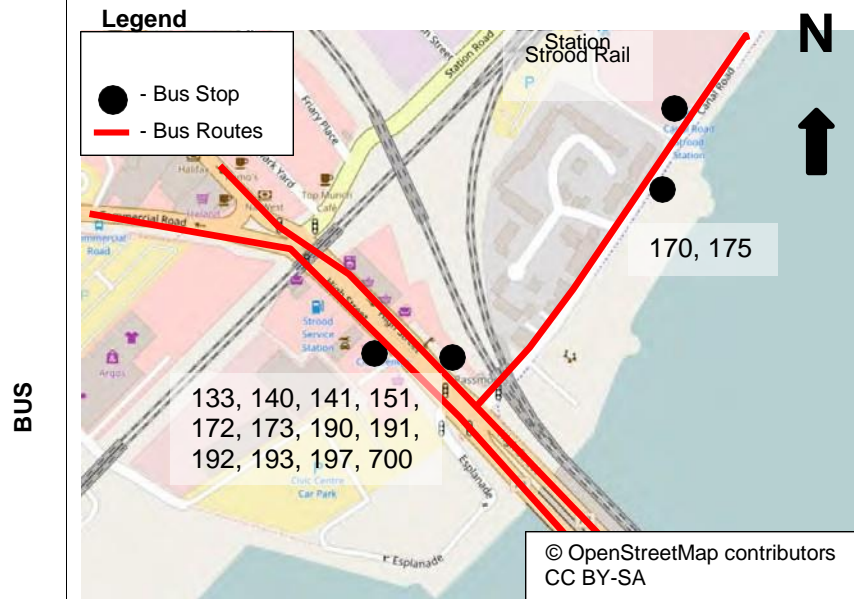
Table 1: Access to Site Description

ACCESS	
VEHICLE	<p>The main highway access into the north of the masterplan area is via the Canal Road junction with the A2 Strood High Street. Access to the south of the masterplan area is available via The Esplanade. The A2 continues north through Strood towards the M2 and south through Rochester and Chatham. Through the Strood Town Centre, the A2 splits into two one-way two-lane carriageways north of Station Road. Commercial Road allows for northbound traffic while High Street allows for southbound traffic.</p> <p>Additionally, there is an access from the north site onto Commissioners Road is currently via a priority junction to the east of the HGV width restriction gate adjacent to the Wingrove Drive junction. The width restriction was put in place in order to prevent heavy vehicle movements to Medway City Estate taking place via Commissioners Road.</p> <p>Carpooling exists but is currently only promoted to Medway Council employees and University staff and students.</p>

ACCESS

Bus service, illustrated in Figure 6, is provided through the development on both Canal Road and High Street. The routes along Canal Road include routes 170 and 175 which stop near the Rail Station. Along High Street there is also a number of bus routes that include the 133, 140, 141, 151, 172, 173, 190, 191, 192, 193, 197, and 700. There is no bus service on Station Road. These bus routes provide services to most town centres across Medway and Kent.

Figure 6: Bus Routes



Despite the number of routes serving the site, the current perception of public transport is quite poor, largely attributable to:

- High tariffs for short journeys;
- Lack of punctuality;
- Congestion and the lack of bus lanes and bus priority;
- Obsolete infrastructure; and
- Lack of thought leadership from main operator.

Bus priority only exists along Corporation (within Rochester) and not within the study area. Due to limited resources, future improvements from the Bus bill for Medway will depend on Kent County Council.

ACCESS	
RAIL	<p>Strood Station is served by three Southeastern rail services including the Northern Kent Line, the Medway Valley Line, and the Southeastern High Speed line. From this station, a number of stations can be reached directly, including:</p> <ul style="list-style-type: none"> • London St. Pancras via the High Speed line; • London Charing Cross via Gravesend and Dartford; • London Cannon Street via Greenwich (during peak hours); • Tonbridge via Maidstone West; and • Ramsgate via Faversham and Gillingham. <p>During the morning peak hour 0800 hrs to 0900 hrs, three trains run direct to London: two to London St. Pancras and one to Charing Cross. The journey time ranges from 35 minutes to 1 hour 25 minutes. Chatham and Rochester Stations nearby also provide frequent services to numerous central London Stations.</p> <p>Although travel times from Strood to Rainham or Chatham by train are faster than by vehicle, train frequency is a factor of consideration.</p>
RAIL STATION	<p>Customer car parking is provided adjacent to the ticket hall building for a total of approximately 115 cars. Pedestrian and cyclist access from Station Road can be gained via the narrow subway to the north side of the railway station. The issue of personal security is the greatest constraint to the use of this facility, particularly during the hours of darkness.</p>
TAXI	<p>A taxi rank is located along Station Road (on the opposite side of the rail tracks from the station hall).</p>
ON-STREET PARKING	<p>There are currently no on-street parking restrictions within the site. Kingswear Gardens has a number of parking courts with unallocated parking taking place on a random basis. Off-street parking in the area is limited to the railway station car park and adjacent to the basketball court area situated off Canal Road. Additional off-street parking is available at the Medway Council car parks. One can be accessed off of Station Road and another off of Friary Place.</p>
PEDESTRIAN AND DISABLED ACCESS	<p>The Saxon Shore Way walk runs north-south through the site alongside the waterfront and links with Wingrove Drive, Commissioner's Road, and the Canal Road junction with the A2 High Street.</p> <p>Strood Town Centre lies less than half a mile to the west of the site. This is an important local centre giving access to a number of retail and community facilities and is generally quite vibrant throughout the week. It is the nearest retail centre to the site and has the potential to provide for a good number of retail needs of future residents at Strood Waterfront.</p>
CYCLE ROUTES	<p>The Sustrans National Cycle Route 1, which extends from Inverness in Scotland to Dover, runs north-south through the site on Wingrove Drive and Canal Road. The route provides a strategic leisure cycle route designed for use by families. Much of the route through the site is currently on the carriageway. A bicycle lane exists from the High Street / Canal Road heading east along the Rochester Bridge. From Wingrove Drive to the north, the cycle route heads uphill to Parsonage Lane and Upnor Road.</p> <p>Medway had at one point considered a bike share scheme, but operators did not feel it would be viable. However, this consideration was before the opening of three university campuses.</p>

ACCESS	
WATERFRONT ACCESS	The Medway River extends along the eastern boundary of the site and provides part of an important leisure and commercial waterway from Tonbridge (south) to the Thames Estuary (north). Currently the usage of the River Medway from Strood Pier is restricted by Medway Ports.

2.1.6 Air Quality Management Areas

Strood Riverside lies within the Central Medway Air Quality Management Area (AQMA), which has been declared for exceedances of the nitrogen dioxide annual mean air quality objective. Air quality will be a material consideration for the development. The STA will be supplemented by an Air Quality Assessment (AQA), programmed for completion in Spring/Summer 2018.

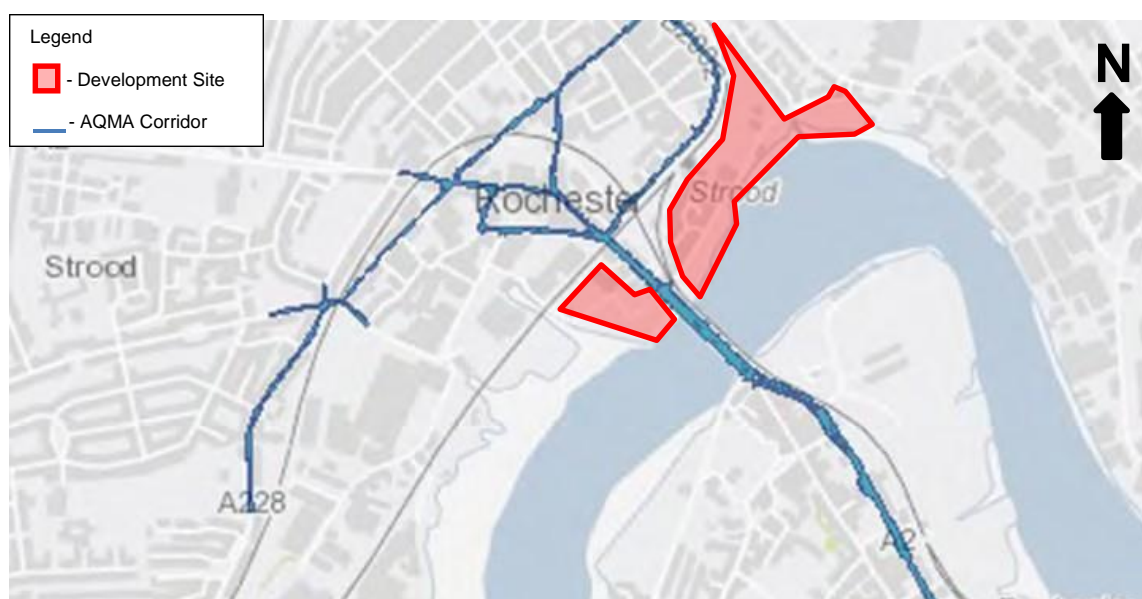


Figure 7: Air Quality Management Area (AQMA) Near the Site

2.2 Proposed Development

The land use of the Strood Waterfront regeneration development is predominantly residential, including up to 25% affordable housing. The development is divided into two areas over a total site area of 8.96 hectares. Site statistics of the preliminary design of the proposed development are summarised in Table 2:

Table 2: Site Statistics

APPROXIMATE SITE STATISTIC	EAST DEVELOPMENT	WEST DEVELOPMENT
Number of flats	1,051 + approximately 500 for Kingswear Garden site	462
Number of houses	115	57
Maximum parking provision	0.66:1	0.75:1
GDA (sq. m)	80250	42342

The access points of the sites remain the same as in the existing conditions except with an additional access for the east development to Canal Road east of the bus only lane. This allows a part of the car park facilities to have access to Commissioner's Road. In addition,

the redevelopment of the industrial area within the east development will vastly improve pedestrian and cyclist access. The development proposes a number of improvements to site accessibility via sustainable modes of travel including:

- Establishing a visual connection between the rail station and bus stop serving the station. This will ensure that those arriving at the rail station have convenient interchange between the two modes of transport;
- Extension of walking and cycling routes to connect to the west development, Janes Creek, and the retail park / Knight Road; and
- Introduction of a promenade along the riverside. This will provide an inviting environment leading to a good experience to people walking, thereby providing a safe and pleasant route for pedestrians.

The majority of the parking is provided within the structures themselves (highlighted in blue in Figure 8 and Figure 9) with a few surface car parks (Kingswear Gardens were not a development at the time the drawings were developed). Access to building parking would be secured and accessible only by permit. Additional station parking could potentially be provided within the structures adjacent to the rail station, subject to agreements between relevant organisations. On-street parking could also be provided for visitors. The parking facility must meet the minimum requirements for disabled parking and cycle parking.

Figure 8: East Development

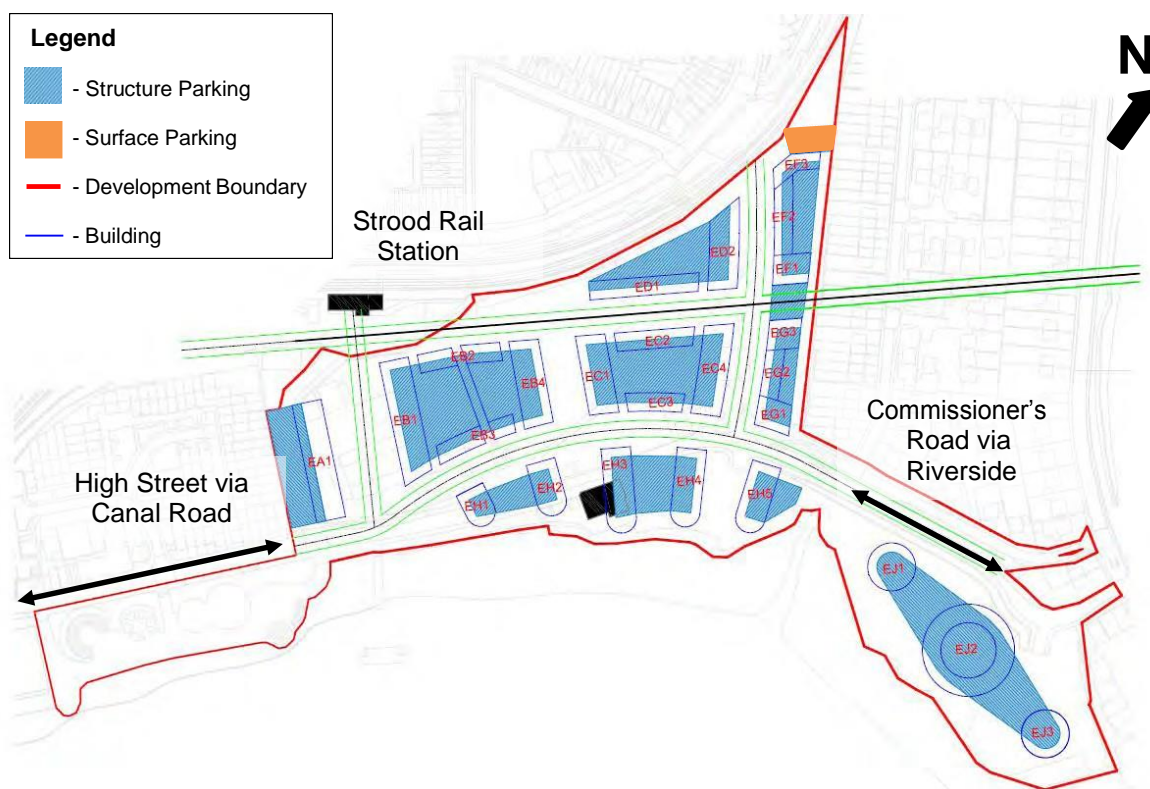
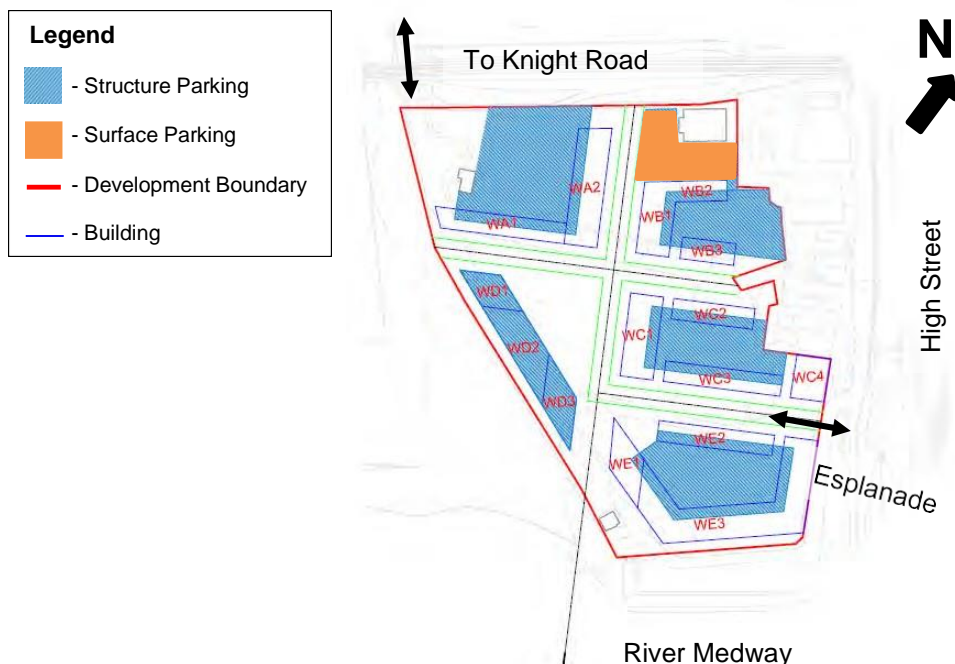


Figure 9: West Development



It is noted that for the development, construction shipments would be made by truck and barge shipments. Barge shipments will have minimum effect on the road network. Shipments made by truck will require careful consideration and planning given the height restriction of the rail bridge adjacent to High Street, narrow width of Commissioner's Road due to on-street parking, and general congestion along High Street.

Regular trips generated by the west development site are due to the Civic Centre, CCTV bunker, and businesses beneath the bridge arches. Despite the removal of the Civic Centre and the trips generated by it, there will be a net increase in trips due to the additional trips generated by the site. Kingswear Gardens and the Strood Rail Station car park are the only land uses expected to generate regular trips. The developments that will replace the industrial areas and Kingswear Gardens will result in a net increase in trips generated for the area.

Access to the proposed site is not significantly different than the existing site. The east development will have two accesses as well, one to Canal Road west of the bus-only lane and another to Canal Road east of the bus-only lane. This will facilitate ingress and egress to the site from High Street and Commissioner's Road both via Riverside. This will limit the impact the development will have on High Street while maintaining the operations of the bus only lane (Figure 8).

For the west development, there will be two accesses. One to a realigned Esplanade which allows for direct access to High Street and another access aligned with the existing Knight Road access (Figure 9).

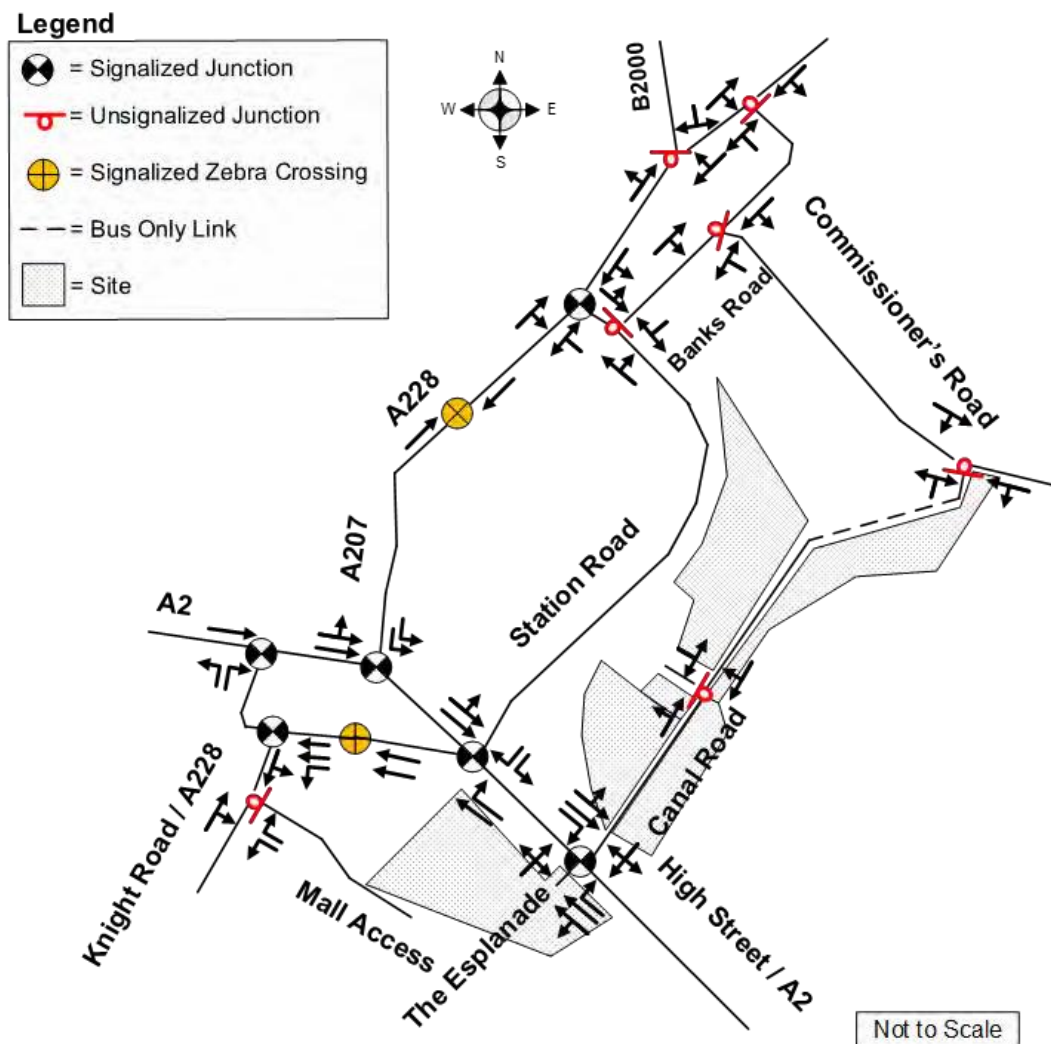
3 Description of Existing Travel Network

The following sections outline the road, bicycle, and pedestrian networks to understand what facilities are available to travellers within the area.

3.1 Local Road Network

The existing local road network configuration is illustrated in Figure 10 below.

Figure 10: Existing Local Road Network



A further description of the different roads are discussed in the sub-sections below.

3.1.1 Canal Road

Canal Road is a two lane carriageway which permits two-way travel. The road can be accessed by all vehicles from the south junction at High Street. The northern part of Canal Road leading to Commissioner's Road and Medway City Estate is a single lane carriageway for buses only. The southern portion of Canal Road allows for access to two sites, the Kingsway Garden residential development and the Strood Rail Station.

3.1.2 High Street (A2)

High Street (A2) is a four lane carriageway that provides access to Canal Road from Strood Town Centre to the northwest and Rochester and Chatham to the southeast. This road

continues and connects to the M2 motorway to the northwest. Through Strood Town Centre, this road splits into two one-way two lane carriageways, Commercial Road towards the northwest and High Street towards the southeast. This split occurs north of the junction with Station Road.

There are bicycle lanes on either side of the carriageway from Rochester beginning and ending south of the junction at High Street / Station Road / Commercial Road. At the High Street / Canal Road / Esplanade junction, the southeast bound nearside lane is a bus lane.

3.1.3 Esplanade

The Esplanade is a two lane carriageway that provides access from High Street (A2) to the Civic Centre parking lot. It is connected to High Street via the same junction as Canal Road. This roadway is primarily used for access to the Civic Centre, businesses beneath arches, and pump station. Occasionally, traffic will use this access to travel through the Civic Centre parking to Knight Road in order to bypass congestion along Commercial Road.

3.1.4 Commissioner's Road

Commissioner's Road is a north/south two lane carriageway with on-street parking connecting the Medway City Estates to Bank Street which leads to A228. Commissioner's Road is connected to the site through Canal Road. Commissioner's Road is also used by traffic to access the A289 (via Berwick Way) as an alternative to the congested tunnel.

3.1.5 Station Road

Station Road is a two lane carriageway that connects High Street (A2) to A228 just north of the site. It also has a junction with Bank Road that leads to Commissioner's Road. On-street parking and a taxi rank are provided opposite the mixed use development adjacent to National Tyres and Autocare.

3.1.6 Banks Road

Station Road is a two lane carriageway, with on-street parking, connecting Station Road to A228 as well as Commissioner's Road to those roadways. It is located north of the site.

3.1.7 A228

A228 is a two lane carriageway north of the site that connects the site to the east and west. The west section of A228 leads to the M2 motorway while the east section of the A228 leads further towards the Thames estuary. The roadway provides connections leaving Strood to the east and southeast.

3.2 Cycle Network

The existing cycle network around the site include cycle lanes on High Street A2 on the bridge over River Medway. This leads to Canal Road which is a signed National Cycle Route extending from Commissioner's Street to High Street. In addition, there are also signed cycle routes along Esplanade from High Street (A2) through the existing car park towards Knights Road.

3.3 Pedestrian Network

The pedestrian network in the area includes pavements on most roadways within the study area. The site is well connected to both Strood Town Centre and Rochester via High Street (A2). As well, for the development east of High Street (A2), pedestrian access is provided from High Street to Commissioner's Road on the south side. This sidewalk makes up part of the National Route Saxon Shore Way. On the north side of the street, pedestrian access is provided up until Strood Rail Station. From the railway station, there is a tunnel that provides access to Station Road under the rail tracks.

4 Existing Conditions

To understand current issues within the local travel network, the existing traffic conditions were established through a review of surrounding transport studies (outlined in Chapter 5), supplemented by a site survey and SCOOT system examination carried out on 8 March 2017.

4.1 Review of Surrounding Transport Studies

The findings for the existing conditions are:

- High Street to the west of the development operates at or near capacity with heavy movements travelling along the roadway;
- Long queues were observed at the Canal Road / High Street / The Esplanade junction along high street. Queued vehicles typically took more than one cycle to clear the intersection;
- The majority of traffic exiting Canal Road performs right turns onto High Street. Canal Road typically operates under capacity for all periods;
- The number of vehicles exiting Canal Road is typically higher in the AM peak period rather than the PM peak period;
- The number of vehicles exiting The Esplanade is generally low;
- Traffic along Commissioner's Road and Banks Road was observed to be free flowing with no congestion;
- Speeds along Commissioner's Road were generally above the posted speed limit of 30 mph based on an ATR count. It can be concluded that Commissioner's Road operates well through all periods;
- In the three year period for which collision data were provided, only two collisions were reported, both of which were categorised as "slight" and between only motor vehicles. There were not enough collisions to identify any collision trends under existing collisions;
- Collisions presented in the business case for the Strood Town Centre Local Growth Fund shows that Strood Town Centre has a high number of pedestrian collisions and significant delays. Although there were a number of collisions involving pedestrian and cyclist within the Strood Town Centre (centred around High Street), there is not enough detail to draw conclusions about collision trends. 31 slight and 3 serious collisions occurred between the years of 2011 and 2014 in the town centre. In order to improve pedestrian and cyclist safety in the town centre, a number of initiatives are being undertaken as part of the Strood Town Centre Improvements project; and
- As part of the business case for the Strood Town Centre Local Growth Fund, a number of ATCs were used to measure the speed in and around the town centre. The results of this survey for the PM period showed that the main problem areas include the northbound approach towards the junction of High Street / Canal Road / The Esplanade, westbound approach of Station Road to the High Street / Station Road junction; and traffic travelling west along Banks Street.

4.2 Site Survey

Observation of the road network through CCTV revealed:

- Generally,
 - AM peak period traffic is lighter than PM peak period traffic;

- Right-turn lane from High Street to Station Road queue was frequently observed to be at capacity and prevent traffic from the upstream Canal Road intersection from progressing. However, the majority of the queue will clear the intersection in one cycle;
 - No queueing issues were observed for movements exiting Canal Road or Esplanade; and
 - Vehicles changing lanes along High Street / Commercial Road between Canal Road / Esplanade and Knight Road could result in significant traffic disruptions.
- During the AM peak period,
 - Queues along Station Road were observed to extend beyond the Grove Road Car Park, but dissipated within a few cycles;
 - Traffic along Commercial Road was observed to be generally light; and
 - Traffic from London Road to Canal Road was observed to be heavy, but moving.
- During the PM peak period,
 - Queues along Station Road were frequently observed to extend beyond the Grove Road Car Park;
 - Queues along High Street were observed to frequently extend from Station Road to beyond the London Road junction. Subsequently, the queue would prevent traffic from Commercial Road from progressing onto High Street;
 - Consistent queues were observed at the A207 / High Street intersection but the extent of queueing could not be determined; and
 - Queues from the intersection of Knight Road / Commercial Road were frequently observed to extend to the High Street / Commercial Road / Station Road; and
 - The ahead lanes on Commercial Road were frequently observed to be blocked due to vehicles trying to access the nearside lane from the channelized right-turn north of Station Road.

Further consultation with Council staff revealed:

- Taxi drop-offs as well as delivery and security vehicles parking along High Street can cause significant congestion issues;
- Vehicles turning right from the retail park onto Knight Road can result in congestion;
- The Strood local market in Commercial Road car park every Tuesday and Saturday, from 9 AM to 3 PM, can cause congestion;
- Vehicles turning right onto Station Road from Aldi occasionally block through traffic;
- To avoid turning right at Station Road, which is frequently congested, drivers turn left and then make a U-turn at High Street / Canal Road / Esplanade;
- Traffic issues can be partly attributed to vehicle alignment and tracking, which are to be addressed by the town centre infrastructure improvements (Chapter 7);
- The pedestrian crossing on Commercial Road west of High Street / Commercial Road / Station Road is frequently actuated, which can cause congestion;
- The junctions of High Street / Station Road / Commercial Road and High Street / Canal Road / Esplanade are pinch points for traffic. Morning delivery, roadworks, or broken down vehicles can bring traffic flow to a standstill; and
- During festivals, the Medway Civic Centre car park is heavily utilised.

4.3 SCOOT System Examination

The Split Cycle Offset Optimisation Technique (SCOOT) traffic control system was examined briefly to show:

- There is a high availability of detectors;
- The validation and calibration of the system are outdated and could use a review;
- Canal Road at High Street is not on the SCOOT system;
- SCOOT is only activated in the event of an incident at the junction at Station Road / A228;
- Advanced SCOOT techniques (e.g. gating) could be employed to assist traffic flow; and
- The change in road systems (following town centre improvements as per Chapter 7) will necessitate new detector loops and re-calibration of the SCOOT system.

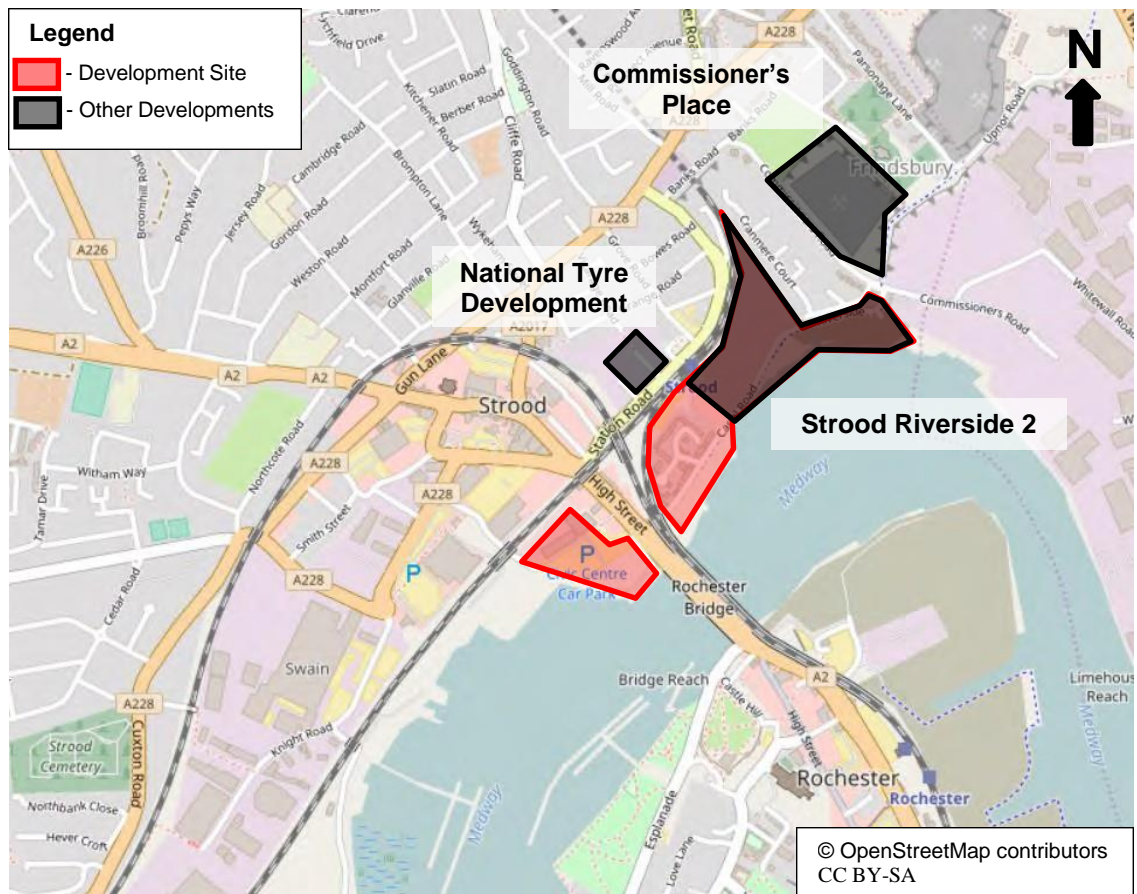
5 Insights from Surrounding Transport Studies

The following section reviews the work of transport studies in the vicinity of the proposed development and summarises their findings. The methods and findings of the studies and their implication on the proposed development will be discussed. The studies include:

- Strood Riverside 2;
- Commissioner's Place;
- National Tyre Development.

The location of the planned developments in relation to the Strood Riverside Regeneration (SRR) project is illustrated in Figure 11.

Figure 11: Background Developments



Further detail regarding the different developments can be found in Appendix A.

5.1 Strood Riverside 2

Project Centre Limited (PCL) was commissioned by Medway Council to carry out a traffic impact assessment of a potential residential development east of the junction of Canal Road and A2 High Street. The study examined the base (existing) and future (with development) operations at two junctions, High Street at Canal Road and High Street at Station Road / Commercial Road. The number of auto trips generated by the development were determined using TEMPRO and TRICS, which were then added to existing counts and modelled with LINSIG. The intersections modelled were High Street / Canal Road / Esplanade and High Street / Station Road / Commercial Road.

Based on the Development Traffic and the Existing Conditions volumes, a Future Conditions scenario was produced and analysed based on the summation of the existing conditions and development traffic. No changes were made to intersection geometry or signals (with the exception of optimising stage durations). Analysis results showed that in general:

- Operations along High Street would worsen during both peak periods; and
- Turning movements from Canal Road will operate over practical capacity with significant queueing in both peak periods;

The modelling results show that the development further saturates the existing network leading to additional traffic delays and queueing at signalised junctions. In order to mitigate impacts of the development, the report recommends:

- Decrease the overall size of the development;
- Creating a less car dependent development;

- Improving public transport service and facilities for sustainable transport modes;
- Allowing site traffic to access Commissioner's Road through Canal Road by removing and widening the bus-only lane; and
- Junction improvements to High Street / Canal Road / Esplanade.

5.2 Commissioner's Place

The Traffic, Transport & Highway Consultancy (TTHC) was commissioned by Medway Preservation and Development Ltd. to carry out a Transport Assessment (TA) as part of a proposal for the development of 130 residential dwellings on Commissioner's Road, Strood. The development was approved on 16 February 2017. Planned parking provision was as per the Medway Council Interim Residential Parking Standards. The proposed development has a high proportion of flats (46%) and 25% of affordable housing units, both of which typically have lower trip rates. However, no reductions to trip rates were made. The report acknowledges that given the development's proximity to Strood Rail Station, the number of trips made by public transport may be higher than that used in analysis (based on TRICS). The proposed access junction was tested using PICADY, and showed that the junction would operate well within capacity. Traffic impacts at the A228 / Station Road Junction and A289 / Anthony's Way Junction were evaluated by comparing the development flows to background flows. The impact of the development was determined to be minimal as the traffic added to the junctions by the development would fall within the limit of daily traffic variation. Furthermore, infrastructure improvements in the area were assumed to improve capacity of the local highway network in the vicinity of the development.

The proposed development with car parking in accordance with the parking standards is not expected to significantly impact the local road network, especially with respect to future committed improvements. No further recommendations were given.

5.3 National Tyre Development

Bellamy Roberts LLP was commissioned by Bellway Homes to provide a Transport Statement for a three/four storey building with 142 square metres of commercial space with 20 flats above (5 one-bedroom flats and 15 two-bedroom flats), with a total parking demand of 14 spaces.

As the site is in close proximity to Strood and Rochester Town Centres and public transport, the development was considered to be "Central" (as opposed to "Town Centre" and "Edge of Centre"). The provision of 1 parking space per unit was acceptable. Furthermore, no onsite parking provision was justified for the office space of the site based on:

- The sustainable location of the site;
- Public car parks within close proximity of the site; and
- Promoting sustainable transport choices as per PPG 13 and the Kent and Medway Structure Plan.

Moreover, the "site provides the opportunity for potential purchasers/tenants to live in a property which provides limited parking space. Clearly, if a potential occupier wanted a flat with more than one space, they have the choice to purchase a flat elsewhere".

5.4 Guiding Transport Statement of Proposed Development

The different transport statements and assessments showed a number of common themes including:

- The Strood Riverside 2 shows that generally High Street is at capacity and very limited development traffic can be added without significant improvements. This leads to the conclusion that this development will have to

rely heavily on sustainable modes of transport and committed future infrastructure improvements.

- The Commissioner's Place development illustrates that development and additional traffic along Commissioner's Road is tolerated. In addition, this development noted that the modal splits in this area could be facilitated by more public transport and rail usage due to proximity to public transport. The development noted that other sustainable modes of transport could be used due to the development's proximity to town centre. These policies could also be adopted for this development as it is relatively close to town centre.
- The National Tyre development demonstrates that the site is recognised as being proximal to the town centre and encourages sustainable modes of transport, which is reflected in its parking policy. Furthermore, the approval of the National Tyre proposal promotes sustainable developments within Strood. Similar to the other developments, this development leads to the conclusion that sustainable modes of transport are possible due to the proximity to rail, public transport, and town centre.

6 Policies Relevant to Development

To understand local and regional goals and to support the transport analysis and plans for the development, a number of different relevant planning documents in the area were reviewed. These documents include:

- The National Planning Policy Framework (NPPF);
- The Medway Local Plan;
- The Medway Local Transport Plan; and
- The "Fixing our broken housing market" white paper prepared by the Department of Communities and Local Government.

The relevance of each document to the site development include:

- As noted in the NPPF, the site should be accessible to all, take into account sustainable modes of transport, and provide mitigation measures to reduce the impact of the development. The development currently being planned satisfies all of the different policy framework notes. Development mitigation measures will look into sustainable and safe modes of transportation to ensure access to all modes of transport.
- The Medway Local Plan noted numerous policies. The development meets a number of these policies including:
 - POLICY T1: IMPACT OF DEVELOPMENT and POLICY T2: ACCESS TO THE HIGHWAY: The development will provide safe access to the development from the highway network that will not generate significant HGV movements while maximizing the use of the surrounding highway capacity.
 - POLICY T3: PROVISION FOR PEDESTRIANS, POLICY T4: CYCLE FACILITIES, and POLICY T22: PROVISION FOR PEOPLE WITH DISABILITIES: The development will have safe access for pedestrians of all abilities as well as cyclists. The facilities for the development will also include pedestrian access to the Strood Rail Station. It should be noted that the development is in very close proximity to Strood Town Centre, and therefore will provide very good connections to the cycling and pedestrian networks in Strood.

- POLICY T6: PROVISION FOR PUBLIC TRANSPORT: The development is located adjacent to numerous bus routes and the Strood Rail Station. Service along Canal Road could be improved to further service the development. This will be discussed as part of the recommendations.
- POLICY T12: TRAFFIC MANAGEMENT: The development will include road layouts designed to be inclusive of all modes of transport. This includes traffic management measures in order to reduce vehicle speeds if required.
- POLICY T13: VEHICLE PARKING STANDARDS and POLICY T15: PARKING STRATEGY: The vehicle parking standards for the development has reviewed different parking standards of the surrounding area and will provide adequate parking for the development. This will include both parking for short and long stays. The goal of this project is to reduce the parking requirements, and this will be done through a variety of measures indicated below. It should be noted that with the increase of other modes in the area (pedestrians, cycling, public transport), parking provisions for this site can be lowered.
- The Medway Local Transport Plan encourages the improvement of safety while making the local travel network more efficient along highways and public transport. This will include:
 - Better information dissemination to all modes of transport and improve traffic management;
 - Improving the infrastructure capacity through finding solutions to congestion hotspots; as well as improved car park and freight management;
 - Improve public transport by providing travel by train, developing Fastrack-style bus links to Chattenden and other sites across Medway, and improving taxi service;
 - Encouraging active transport to provide more facilities and connections with public transport; and
 - Improving road safety for all users.
- Through these different initiatives, the plan encourages and improves other modes of transport other than car, especially sustainable modes. As noted previously, the site is focused on sustainable modes of transport that aligns with the policies noted in the Local Transport Plan. The development will encourage public transport and include facilities for active transport.
- The fixing our broken housing market white paper noted that government needed to “address the particular scope for higher-density housing in urban locations that are well served by public transport (such as around many railway stations); that provide scope to replace or build over low-density uses (such as retail warehouses, lock-ups and car parks);”. This development perfectly fits this description as it replaces a low density area with higher density residential. The development also is well situated to the town centre and to public transport. With the focus on higher density developments near public transport facilities, the government policies are moving away from car oriented developments which would encourage reduced parking provisions.

A further detailed summary of the different policy documents and white papers can be found in Appendix B.

7 In-flight Initiatives Relative to Development

In-flight initiatives were reviewed to gain insight as to how they would impact the travel network serving the development. During 2014, Medway compiled a number of schemes as part of the Local Enterprise Partnerships (LEP) bid for the governments Local Growth Fund (LGF). Medway received £28.6 million for five schemes, including:

- Chatham Town Centre and Public Realm Package. These improvements are expected to shift mode splits from automobile to other sustainable modes (i.e. walking and cycling) which will divert vehicles from town centre areas (including that of Strood) which would impact the road network adjacent to the development;
- A289 Four Elms Roundabout to Medway Tunnel Journey Time and Network Improvements. The scheme is expected to reduce traveller congestion through road junction delay savings and improve journey reliability. As a result of these improvements, it is anticipated that the A289 would become a more attractive option to drivers travelling west rather than via Rochester and Strood Town Centres. Consequently, this would provide additional capacity at the junctions along High Street (A2) which are operating near capacity currently;
- Medway City Estate Connectivity Improvement Measures. The measures from this improvement will help to shift the modal split away from travelling by car, thereby reducing traffic to and from Medway City Estate which uses the same road networks as the site development would. This decreased usage would provide additional traffic buffer capacity that could accommodate the potential development traffic;
- Strood Town Centre Journey Time and Accessibility Enhancements. This scheme improves accessibility and creates a more sustainable network through modal shift will help to establish conditions that will act as a catalyst to increase capacity of current and future development opportunities. This will support development's goals for reduced parking provisions to promote sustainable transport. The improvements to the town centre will encourage residents of the future development to use sustainable modes of transport, therefore reducing the parking requirements. Furthermore, one of the primary purposes of this scheme is to provide sustainable access to the proposed development. Specifically, this scheme will decommission the traffic signal at Knight Road / Commercial Road and resurface the town centre, which will necessitate a recalibration of SCOOT systems;
- Medway Cycling Action Plan. This plan will support the traction that cycling is gaining as a mode of transport in Medway. This is expected to increase further with Medway Cycling Action Plan. Consequently, a modal shift towards cycling will reduce the traffic impact of the regeneration development; and
- The Public Rights of Way Improvement Plan. This plan will further enhance the facilities for all users, therefore increasing the use of sustainable modes of transit other than car. This will lead to lowering the effect of the development on the traffic network as users would be encouraged to use other modes of transport other than car.

In addition to the above schemes, Medway is working to improve path access for walkers around Medway, as per the Public Rights of Way Improvement Plan.

A summary of the different in-flight initiatives can be found in Appendix C.

Generally, the in-flight initiatives in the area surrounding the site fall in line with the goals of the Local Transport Plan. There are a number of initiatives that are changing the priorities of the transport system in the surrounding area to be more sustainable including an expansion of the cycling network as well as improvements to the right-of-way for not just cars but pedestrians. These improvements to sustainable transportation are focused in and around the Strood Town Centre, improving these modes for future site users. In addition, capacity

on the roadways at key junctions which will serve development traffic are increased through Intelligent Transportation Systems such as SCOOT and improvements to the by-pass roads (A289) will provide more capacity along roadways near the site. As a whole, these different improvements will provide better access to the site for all modes of transportation in the area.

8 Parking Provision

This section provides an overview of parking standards and other measures used to lower parking rates at developments. These measures are relevant for the context of the development currently being proposed.

8.1 Parking Standards

Development parking standards for Medway Council and surrounding regions will be reviewed to identify regional trends.

Parking standards for developments in Medway, other local councils, and Kent are summarised in Appendix D.

In general, councils within Kent County adopt some form or another of Kent County Council's parking standards, with the exception of Medway Council. Although Medway parking standards mention that lower parking rates would be considered if the development were "within an urban area that has good links to sustainable transport and where day-to-day facilities are within easy walking distance", no lower limits are expressed and were not found in the other developments reviewed. In lieu of lower parking provision rates, the Interim Guidance provided by Kent County Council can be used as "the previously adopted standards for residential parking in Kent are a reasonably accurate guide to the upper levels of expected ownership in the county". Given the proximity (maximum walking distance of approximately 800 m to the town centre), the development should be considered to be within the "City/Town Centre". Therefore, the parking guidance rates which show that a maximum of 1 space per unit should be provided with the further provision that **"reduced, or even nil provision is encouraged in support of demand management and the most efficient use of land"**. Moreover, it is generally recognised that flats, which the site development is primarily comprised of, have lower parking rates than individual homes.

8.2 Car Clubs

Due to challenges of congestion, population growth, and the emissions, car clubs have provided a flexible and cost-effective alternative to addressing these challenges. Furthermore, the Kent County Council has found that "Car Clubs' are a particularly useful feature of residential travel plans where travel flexibility without high car ownership is sought". Global and local experiences with car clubs and their impact on parking provision are summarised in the following sections.

8.2.1 Local Experience

Car clubs have also been successfully used in the UK to reduce parking provision, emissions, and impact of private vehicle trips from developments. Furthermore, car clubs have contributed to reaching policy objectives including modal shift.

A car club operator will need to be consulted to assess the viability of a car club operation. However, case studies around the UK have shown that car clubs have shown potential for the reduction of parking provision in the case studies found in Table 3.

Table 3: Car Club Case Studies

DEVELOPMENT (PARKING RATIO)	PARKING PROVISION	SUCCESS FACTORS
259 City Road Islington (Total 0:26:1)	<ul style="list-style-type: none"> High rise, high density mixed tenure residential development (retail, parking, parks, walkways) 304 units private and affordable housing, 78 parking spaces 	<ul style="list-style-type: none"> Incentives (free 2-year membership and £60 free credit) Promotion before move-in and within welcome packs Shared between business and residents High number of vehicles within proximity to development
New River Village Haringey (Affordable apartments 0:26:1) (For sale 0:78:1) (Total 0.65:1)	<ul style="list-style-type: none"> High-density residential development (restaurant, bar, gallery) 465 units for sale, 157 units affordable housing, 406 parking spaces 	<ul style="list-style-type: none"> Large number of units with limited parking Incentives (free 1-year membership & 20% discount for first 12 months) Shared between business and residents <p>High number of vehicles within proximity to development</p>

8.2.2 International Experience

In 2009, IBI Group examined the impacts of car share programs (car clubs in Canada) on parking standards in Toronto, Canada. Through review of literature, best practices, existing policy, by-laws in the City of Toronto, and a survey, the following analysis results showed that:

- The presence of dedicated car share (car clubs in Canada) vehicles was shown to have a significant negative influence on the average auto ownership and parking demand of building residents, providing justification to reduce parking requirements for multi-unit residential buildings providing dedicated car share vehicles.
- For any apartment or condominium development, the minimum parking requirement should be reduced by up to 4 parking spaces for each dedicated car share stall. The limit on this parking reduction is calculated as the greater of:
 - 4 * (Total number of units / 60), rounded down to the nearest whole number; or
 - 1 space.
- Where a maximum parking ratio is specified, dedicated car share parking spaces should not count towards the maximum allowable parking supply, up to 10% of the maximum number of parking spaces.

The report also includes implementation considerations and other requirements for car sharing.

8.3 On-Street Parking

8.3.1 Technology

Non-allocated parking can capitalise on different types of ownership to use parking spaces in the most efficient way. They can also be used to satisfy visitor parking based on different occupancy parking patterns throughout the day (e.g. a person who commutes can rent out

their space to a shopper). Furthermore, Kent County Council found that “where effectively enforced on-street parking controls (or positively managed covenants/agreements) limit the opportunities for residents to own cars that they cannot accommodate in dedicated parking areas, lower levels provision will not cause problems”. Several developers have pursued developments with non-allocated parking (mostly houses).

Another strategy to limit the need for parking would be to use space renting platforms (e.g. JustPark). JustPark provides an online platform for residents to rent out their parking spaces, has several spaces around Strood and Rochester listed. It is one example of many that can be used to streamline parking operations around the site and increase overall parking efficiency within Medway. Other successes have included:

- Implementation of sensors into individual parking bays in Milton Keynes which can detect whether the bay is occupied or not. The information collected from the sensors can be used to provide parking customers with real-time information; and
- Online, mobile phone, and cashless parking management in Westminster. Furthermore, enforcement is carried out by Automatic Number Plate Recognition (ANPR) technology and a number of parking stewards.

Using technologies and methods discussed above, a lower provision for visitor parking would be recommended.

8.3.2 Permits

On-street parking can be potentially provided. Currently, on-street resident parking permits for Medway cost £27 per year. In order to address on-street parking issues, Sevenoaks District Council has implemented a sliding scale of charges to address issues with parking, maintenance, and enforcement. Sevenoaks District Council believes “those who park more cars on the road have a bigger impact on the parking issues in the area [and hence] will pay more for their permits”. The cost of a resident on-street parking permit can cost from £35 per permit to £250. Non-resident on-street parking ranges from £270 per year, up to £765 for those who can park near the Sevenoaks rail station.

Furthermore, if on-street parking is provided for, some form of parking control will be required in order to maintain smooth vehicle access (visitor and emergency vehicle) to the site. Controlled parking zones, which permit parking only during certain periods can be implemented. Controlled parking zones are designated through signage and pavement markings.

8.4 Car Ownership

2011 Census car ownership data of areas in the vicinity (1000m) of Strood, Rochester, and Chatham rail stations (Figure 12) were reviewed. Isochrones of 1000m (approximately 15 minute walk) were chosen as they are the “suggested acceptable walking distance” as per the 2000 CIHT Guidelines for Providing for Journeys on Foot. The data, summarised in Table 4, showed that the areas adjacent to Strood Rail Station, 28% of households do not have a car or van. Based only on car ownership census data, the development could have a parking provision of 0.72 if 28% of residents do not own vehicles, and vehicle-owning residents are limited to one space per household or flat (to align with sustainable parking provision as per Kent County Council guidelines). However, the parking provision reductions could be pursued beyond the status-quo as 39% of households within the Rochester and Chatham isochrones do not own cars (translating into a parking ratio of 0.61). Furthermore, the proximity of the developments to Strood and Rochester rail stations is likely to attract a train commuter market, which would further reduce the need for regular private vehicle trips and parking space. Occasional private vehicle trips by these train commuters could be made using car club vehicles. Similar to the approved National Tyre Development, those wishing to make regular trips by private vehicle and needing more than one parking space may not find

these developments suitable and will be able to seek out developments that cater more to their needs. The low overall car ownership rates discussed above would lead to a conclusion that lower parking rates could be feasible for this development.

Figure 12: Walking (15 minutes/1 km isochrones) from Rail Stations

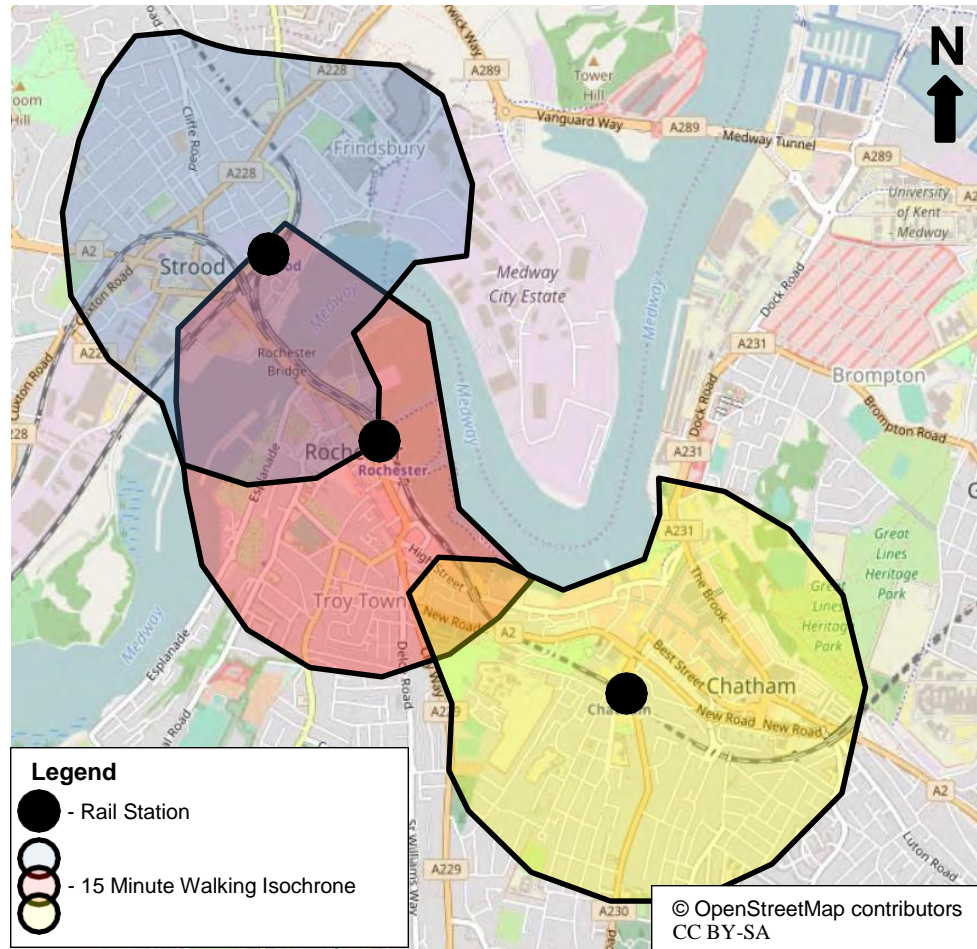


Table 4: Car Ownership

CAR OWNERSHIP	AREA		
	CHATHAM & ROCHESTER	STROOD	TOTAL
All categories: Car or van availability	7,729	3,181	10,910
	100%	100%	100%
No cars or vans in household	3,008	878	3,886
	39%	28%	36%
1 car or van in household	3,350	1,419	4,769
	43%	45%	44%
2 cars or vans in household	1,155	704	1,859
	15%	22%	17%
3 cars or vans in household	169	141	310
	2%	4%	3%
4 or more cars or vans in household	47	39	86
	1%	1%	1%

8.5 Strood Waterfront Parking Provision

To align with current standards, available technology, and goals of transport plans in the area, the parking provision for the Strood Waterfront development could be less than one space per unit as:

- Parking standards indicate a maximum of one space per unit;
- Developments with car clubs have been approved and successfully implemented with parking provision of less than one space per unit;
- On-street parking can accommodate both visitor and resident parking if occupancy parking patterns permit; and
- A previous development was accepted with no provision for non-residential parking due to proximity and access to local transport links.

It is recommended that a minimum parking provision be sought below a ratio of 0.61, with further reductions pending car club feasibility study, technology implementation (e.g. online platforms, parking sensors, etc.), and parking surveys of the existing area.

9 Site Generated Traffic

This chapter discusses trip generation and distribution in order to understand in general terms, how many vehicles are being generated by the development and what routes on the network they will take. It should be noted that the modal splits are only for work trips (commuting) as this is the only data Census 2011 provides. Furthermore, it was assumed that the parking of the east development would be able to access either only Canal Road or Commissioner's Road as accessing only Canal Road would not be feasible given the results from the Strood River 2 traffic impact assessment.

9.1 Modal Splits

Census 2011 data was further examined to determine what modes were taken to travel to work for those living in vicinity to a rail station. Previous analysis in the Strood Town Centre Local Growth Fund showed that "rates of walking are lower than in neighbouring Rochester and lower than in Medway as a whole, and significantly lower than the South-East average". The travel data of the areas immediately surrounding the Strood, Rochester, and Chatham rail stations was analysed and summarised in Table 5.

Table 5: Modal splits of those living in vicinity of a rail station

LIVING ADJACENT TO	MODAL SPLIT				
	DRIVING A CAR OR VAN	TRAIN	BUS	BICYCLE	WALKING
Strood rail station	59%	12%	5%	2%	14%
Rochester rail station	53%	21%	4%	2%	14%
Chatham rail station	43%	17%	9%	2%	19%
<i>Average</i>	<i>52%</i>	<i>17%</i>	<i>6%</i>	<i>2%</i>	<i>16%</i>

The analysis shows that in comparison to the modal splits summarised in Figure 13, modal splits by non-car or van made by residents adjacent to rail stations are generally higher, especially for trips made by train or on foot. Therefore, lower automobile trip rates for the Strood Waterfront regeneration development is justified. An average of the three areas will

be used as it would be expected that an increase in population immediately adjacent to a rail station would decrease the proportion of residents travelling by car.

Figure 13: Modal Splits as per the business case for Strood Town Centre Local Growth Fund

Area	Total travelling to work	Modal Splits (other modes not included here)				
		Bicycle	Bus, minibus or coach	Driving a car or van	On foot	Train
South East	3,758,139	3.3%	4.9%	70.4%	11.1%	8.0%
Medway	116,767	1.2%	5.0%	72.2%	10.0%	9.4%
Rochester	14,829	1.3%	4.7%	69.0%	10.9%	11.9%
Strood	19,189	1.0%	4.9%	76.9%	7.7%	7.4%

9.2 Trip Generation

The rate used to generate automobile trips is the total trip rates per dwelling by all modes used in Commissioner's Place development (1.061 and 0.950 trips per dwelling in the AM and PM peak periods, respectively) adjusted using modal splits derived from the Census 2011 data. The trip rate is summarised in Table 6.

Table 6: Automobile trip rates

MODE	TRIP GENERATION RATE (PER DWELLING)					
	AM PEAK PERIOD			PM PEAK PERIOD		
	ARRIVE	DEPART	TOTAL	ARRIVE	DEPART	TOTAL
Automobile	0.141	0.410	0.552	0.319	0.176	0.494
All Modes			1.061			0.950

Based on the assumed number of units for each development site, the number of trips is summarised in Table 7.

Table 7: Total number of automobile trips

DEVELOPMENT	NUMBER OF UNITS	AM PEAK PERIOD		PM PEAK PERIOD	
		DEPARTING	ARRIVING	DEPARTING	ARRIVING
West development	500	205	70	88	160
East Development (to Canal Road)	750	308	106	132	239
East Development (to Commissioner's Road)	750	308	106	132	239

9.3 Trip Distribution

Trip distribution was carried out using a combination of:

- Census 2011 Origin Destination data [trips originating from E02003319 : Medway 006 (2011 super output area - middle layer) divided by mode as per WU03EW];
- Peak travel times estimated by Google Maps;
- Congestion and traffic issues in Existing Conditions; and

- Anticipated driver behaviours and preferences.

Trip distribution diagrams based on approximate unit numbers for the AM and PM peak are available in Appendix E.

10 Mitigation Measures

The potential mitigation options to reduce the number of car trips and/or the impact of site generated traffic are separated into different “levels” in terms of scale (geographical). It is important to note there is no single influence or measure that will be able to solve either background or development transport issues. The solution lies in combining the benefits of numerous individual measures and improvements.

10.1 Council-wide Foundational / Policy Initiatives

At this stage, council-wide foundational policies and initiatives are not within the scope of this Transport Statement. However, it is expected that these will need to be undertaken at some point given the anticipated growth of Medway.

10.1.1 Review of Car / Van Mode Alternatives

In order to encourage more public transport use and limit the use of the Strood Station car park, service on Canal Road should be improved. Bus routing and headways should be further investigated in a future study. Furthermore, discussion with train operators regarding frequency may be warranted given the significant increase in the number of homes in the area. Although previously considered unviable, the possibility of bike share schemes could be revisited since the opening of three university campuses in the Medway campus.

10.1.2 Parking Strategy Planning

It is an ambition of Medway Council to undertake a parking strategy. Medway continues to evolve into an increasingly urban place with greater land use intensity. This growth necessitates the development of robust parking standards that are context sensitive and will balance a variety of transportation and development objectives.

10.1.3 Overall Strategic Transport Plan

The current Local Transport Plan recognises the need for further river crossings, especially one that could encourage “movement across the river by more sustainable means”. As more residences are constructed in Medway, an additional river crossing will become essential.

Until then, the Local Transport Plan could be updated to harness “smart” technology to fully utilise current assets as well as enhance citizen experience of transport.

10.1.4 Travel Behaviour for Travel Demand Management

Using customer communication strategies to meet the requirement and desire to manage demand on the road which results from recurring increases in demand (e.g. during peak periods), a sustained growth in demand over an extended period (e.g. population growth) or the reduction in available capacity, is not new.

In recent years, however, there has been an increased focus on the strategic approach to achieving demand management, whether that is an attempt to achieve an overall reduction or a change in the profile of that demand.

These strategic approaches have considered a range of interventions that include marketing and communication strategies, an improved use of information technology and the better use

of existing or new channels to reach customers (including operator owned and third party owned) to elicit some travel behaviour change.

What has unified these strategic approaches is a commonality in how they seek to understand the range of customers and adapt a proposition to these distinct customer groups to achieve marginal, and in limited cases, substantial changes in travel behaviour resulting in reduced demand.

In each case these projects/programme attempted to quantify the impact to road users and the subsequent interventions targeted the objective of reducing the impact to the customer. Whilst the quantification of the problem differed (e.g. delay, journey time, customer experience), it formed the backbone of the proposition to road users.

For instance, 'As a result of congestion between 8 am and 9am journey times will be by 15 minutes more than outside these times.' Additionally there was an understanding of how much change was required to achieve a level of success. For instance, a 5% reduction to achieve a delay of no more than 10 minutes.

Analysis of the different customer groups who would be impacted was completed with the purpose of understanding what would motivate a travel behaviour change (e.g. articulating the likely extent of a delay). This allowed project teams to refine the proposition which could be provided to each customer group. Whether that was that there was a better time to travel or that other modal options were available.

Accepting that different channels reached different customer groups, attempts were made to provide appropriate messages for different channels. For instance, channels that would reach customer prior to commencing a journey would proposition the possible modal or directional alternatives whereas on-system information may have described better times of travel, accepting that a behaviour change might result in subsequent days.

A process of monitoring the impact of interventions was instigated that would allow for the reporting of the success or otherwise of the project but also informing the need for any adaptation in the extent or tone of information and advice.

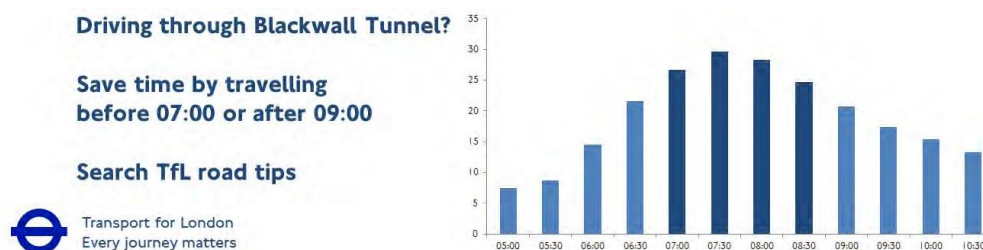
Acknowledging these broad principles a possible mitigation of existing and future road congestion may be to apply some form of demand management through travel behaviour change. In order to understand the capability of achieving this, a number of key questions should be answered:

1. **Understand the customer profile and segments.** Is there an understanding of the customer and the purpose of their journey?
 - a. Who are the drivers/road users (e.g. commuters, residents, etc.)?
 - b. Why are they travelling (e.g. work, home-work, etc.)?
 - c. Where are starting/ending their trips?
2. **Understand the detail of congestion.** During what times are roads congested?
 - a. Is there a concentration during particular time periods? E.g. 8 am to 9am
 - b. Outside of the busiest period, how much road capacity exists?
 - c. What about roads around the town centre, what is the level of congestion?
3. **Customer options.** What the other modal or journey route options exist?
 - a. Are there realistic modal options?
 - b. Are there realistic route options?
 - c. If so what are the current barriers to their use?
4. **Understand the customer proposition.** Is the customer proposition understood?
 - a. Based on what is known about the customer segments is it possible to identify target groups?

- b. What might motivate travel behaviour change?
 - c. What is the proposition to these customer groups? Better experience, reduced journey time?
5. **Defining a target.** How much travel behaviour change (manifesting as a reduction in demand during the congested period) is required for this to be successful?
- a. Is a very small change in short term travel behaviour change likely to make a larger cumulative impact?
 - b. Is the strategy to focus on the peak of peak or a broader time shift or reduction?
6. **Reaching customers.** What mechanisms exist to reach customers?
- a. Having understood target groups, options and propositions and success criteria which information channels should be used?
 - b. What is the strategy for information channel use?

An example of a travel demand management campaign from TFL is shown in Figure 14.

Figure 14: Travel demand management example



10.2 Measures for the Surrounding Area

10.2.1 Time Slots for Business Deliveries

To mitigate the impact of vehicles parking along High Street which cause congestion, a system where deliveries and pick-ups are scheduled within certain time slots should be implemented.

10.2.2 Expansion of Traffic Monitoring

The ability to view traffic conditions is crucial to successful traffic management. Medway Commercial Group and Medway Council both have CCTV cameras within Strood. However, the monitoring is limited to the town centre, Civic Centre, and several car parks (Strood Rail Station, Grove Road, and Commercial Road). Due to the infrastructure improvement schemes and the potential SRR development, CCTV coverage will likely need to be expanded to cover blind spots which will become important traffic corridors such as Knight Road, Canal Road, Cuxton Road, Gun Lane, A228, and Commissioner's Road.

10.2.3 Traffic Signal Control System

Due to the signal and pavement changes from committed infrastructure improvements, it is recommended that the SCOOT system be updated and recalibrated in order to ensure efficient traffic flow within Strood. The system may also require expansion to accommodate for growing traffic volumes.

10.2.4 Parking Guidance

Drivers who circle around an area looking for a parking space can increase congestion as well as emissions. The parking guidance around Medway could be enhanced to maximise

parking assets through technology, such as parking rental platforms, parking sensors, cashless payments, and better wayfinding to and within parking lots.

10.2.5 Electric Charging Points

Site traffic will travel along AQMA routes which will in turn increase emissions. Electric charging points should be provided around the area for hybrid and electric vehicles (low or zero emission) that will aid in maintaining high air quality for residents.

10.2.6 Junction Modifications

It should be noted that these junction modifications are not mutually exclusive.

10.2.6.1 Conversion of Esplanade to a one-way relief road

The introduction of a by-pass through Esplanade to shift traffic off the main A2 corridor and onto Knight Road as illustrated in Figure 15.

Figure 15: Esplanade relief road



Considerations will need to be given to preventing flooding, Environmental Agency requirements, impacts to residents (e.g. noise, pollution), and the impact on the development value. A left-in left-out relief line could also be constructed, but would require appropriating the shops on the north-east corner of the land.

10.2.6.2 Knight Road / Access

Knowing that right-turning traffic from the Access onto Knight Road can cause congestion, signalling the intersection may be required to accommodate traffic turning onto Knight Road. As the signal at Commercial Road / Knight Road is being decommissioned, it is not expected that "relocating" the signal to Knight Road / Access would cause significant issues.

Alternatively, the right-turn could be banned to avoid the issue altogether. However, westbound volumes on Knight Road might make turning right into the Access difficult, which would result in all traffic returning to that access of the development to travel along High Street / Commercial Road.

10.2.6.3 Widening Access Road leading to Knight Road

The road currently allows only one vehicle to pass at a time (vehicles heading towards Knight Road must yield to those heading towards the Civic Centre), and widening is unlikely to be an option due to the rail track supports on either side of the roadway, as pictured in . However, if the sidewalk(s) were removed and a pedestrian access relocated under the rail tracks then the roadway could potentially be converted to a two lane roadway. Further geometric study and right-of-way would need to be carried out. Furthermore, a pedestrian crossing would need to be added north of the rail overpass.

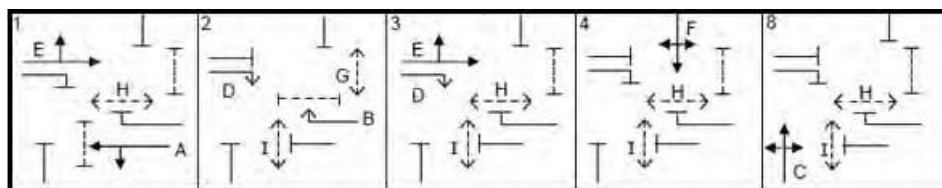
Figure 16: Underpass leading from Civic Centre to Knight Road



10.2.6.4 Operating Right-out Only at the High Street / Canal Road / Esplanade intersection

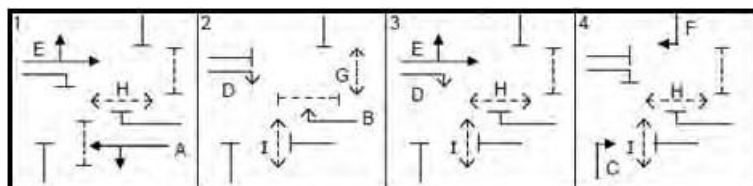
Currently, a simplified version of the traffic signals operates as shown in Figure 17 (left-right is travel along High Street, up and down is Esplanade and Canal Road, respectively).

Figure 17: Simplified High Street / Canal Road / Esplanade signal phasing diagram



By converting the intersection to a right-out only for Canal Road and Esplanade, the intergreen between stages 4 and 8 can be eliminated (combining stages 4 and 8), as illustrated in Figure 18. This would increase the capacity of the intersection.

Figure 18: Combined stages at High Street / Canal Road / Esplanade



Esplanade would be converted to restricting Esplanade to only emergency and maintenance vehicles, more time can be given to the exit on Canal Road while allowing full movement. A method of preventing general traffic from activating the Esplanade phase would be required and could come in the form of either transponders that would be recognised by the intersection or a physical barrier.

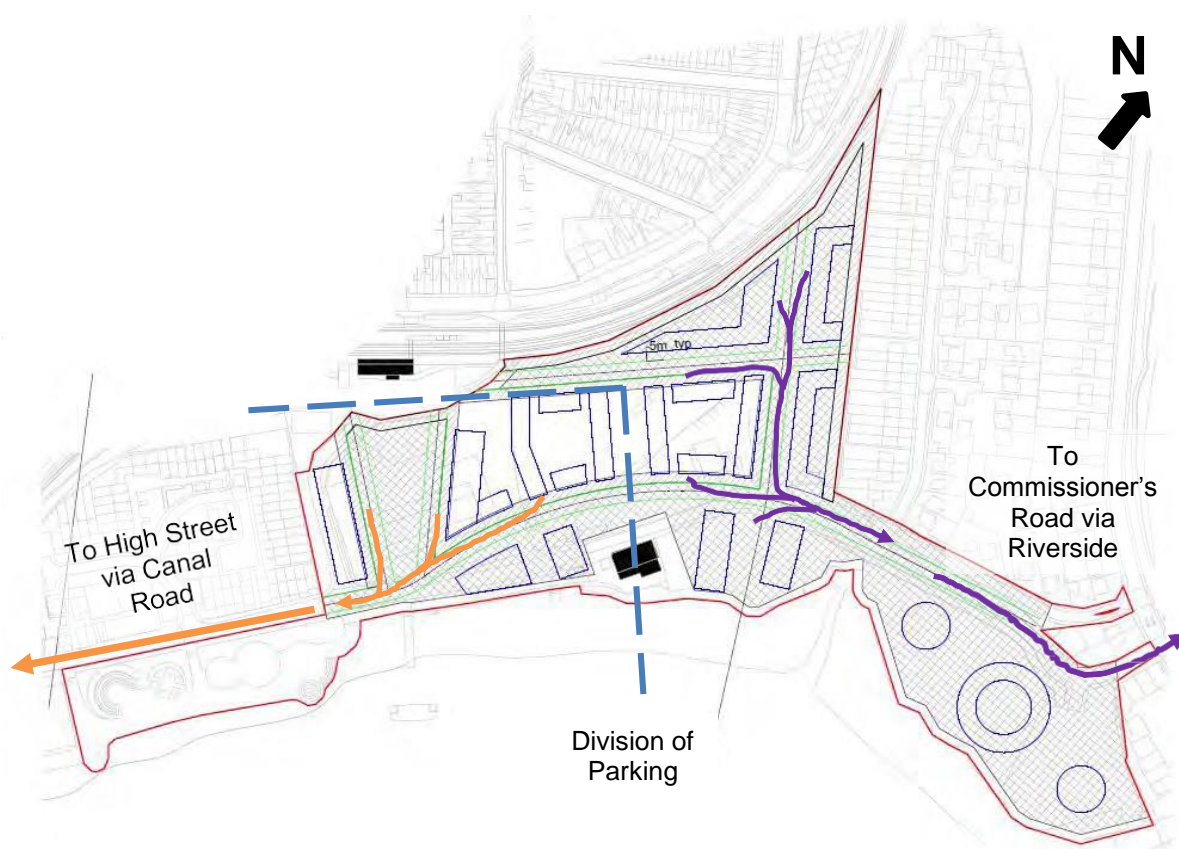
Traffic for the site west of High Street will enter/exit the site using the access intersecting Knight Road.

10.3 Site Specific Strategy

10.3.1 Parking Design

Divide Strood Riverside parking (east of High Street) such that a portion will access their parking via High Street and the remaining portion will access their parking via Commissioner's Road. This does not necessitate the conversion of Canal Road to become a two way road, which will prevent commuters from MCE from infiltrating the neighbourhood. The division of parking access will help to limit the impact to the High Street / Canal Road / Esplanade intersection while still maintaining access to the site.

Figure 19: Division of parking



10.3.2 Further Origin Destination Data Analysis

As census data only provides information regarding commute trips, further origin destination data should be reviewed for all types of trips to ensure a thorough analysis. Given the proximity of the potential development to local amenities, the proportion of car or van trips made could decrease (as errands and school trips could be made on foot). A lower modal share of trips by car or van would decrease the expected number of vehicles generated by the development which would equate to a lower impact on the network.

11 Impacts to the Travel Network

This section provides an overview of impacts of the development on the travel network based on proposed mitigations and the parking re-provisioning. The effects of the development are as follows:

- The adjacent highway network will experience a significant number of additional vehicle trips due to the development during peak hours;
- Preliminary trip generation and distribution show that trips from the site add significant volumes which would likely result in further congestion at the existing traffic chokepoints:
 - High Street / Canal Road / Esplanade;
 - High Street / Station Road / Commercial Road; and
- The following intersections are currently under capacity, but traffic volume increases could potentially cause delays include:
 - Commissioner's Road at Canal Road (during the PM peak period only);
 - Knight Road / Access;
 - A2 / Cuxton Road / Gun Lane;
 - A228 / Station Road; and
 - Station Road / Banks Road.
- Given that Strood Town Centre is generally congested and junctions operate at capacity, any additional traffic would result in further congestion and capacity issues. However, infrastructure improvements in the surrounding area are expected to divert traffic from the A2, reduce the modal share of automobiles, and improve traffic flow within Strood Town Centre. Without the quantitative knowledge of how much these improvements are expected to make, a base future scenario cannot be established. Consequently, analysis of the future base scenario with development traffic cannot be analysed.
- However, the combination of committed infrastructure improvements (in-flight initiatives), justifiably lower parking standards and automobile modal share, as well as mitigation measures, suggests that the road network would arguably be able to accommodate the proposed development.
- The impact to the public travel network will be moderate. With additional public transport trips expected, the rail and bus network in the surrounding area would need to be enhanced in order to accommodate this. A further study of the public transport enhancements would be required.
- The impacts to pedestrian and cycling will be an improvement as the additional connections provided by the site will enhance pedestrian and cycling facilities.

12 Conclusions

The conclusions of the report are as follows:

- Currently, the accesses for the proposed development have light traffic and are under capacity. However, the surrounding road network is generally congested during peak hours especially along High Street and its junctions at Canal Road and Station Road;
- The site is generally well connected due to its proximity to the town centre and the Strood Rail Station;

- A review of Transport Statements and Transport Assessments of the surrounding area shows that the proposed development will need to rely heavily on sustainable modes of transport (which is achievable given the site's proximity to non-automobile modes of transport);
- Policies, plans, and research indicate that developments should encourage and provide sustainable transport (active and public transport) and "address the particular scope for higher-density well connected by public transport". Future plans for Medway include the improvement of public transport service and active transport facilities;
- Regardless of the development, there are significant efforts that must be made to improve the travel experience for those accessing Medway;
- In-flight initiatives in the region show a number of committed future infrastructure improvements. This includes improvements to the roadway capacity surrounding the site area and improvements to the town centre for pedestrian and cycling access. In conjunction with these other initiatives, the development has the potential to establish an ongoing trend of sustainable developments in Medway;
- A review of census data reveals that up to 39% of those living within proximal to a train station do not own cars. This, in combination with a thorough review of parking provisions for Kent and Medway point to a parking ratio of 0.61. This rate can be further lowered through emerging trends and technologies such as Car Clubs, low car ownership in the surrounding area, and improved technologies to maximize available parking for the development and in the surrounding areas; and
- The impact on the future network based on trip distribution shows that there will be additional trips on the High Street that may result in worse operations. However, in order to do an adequate and in-depth analysis of the traffic impacts of the development, future base conditions must be approximated. This requires the effects of the in-flight infrastructure initiatives to be quantified in terms of their impact on traffic. This information is currently unavailable at this time, however this can be tested through Medway Council's Strategic Transport Model (STM) in the future. It is possible that proposed mitigation and committed initiatives by Medway could accommodate the additional development traffic.

13 Recommendations

To thoroughly understand and anticipate the impacts of the proposed development, the following should be performed:

- Trip and mode survey of developments adjacent to Strood Rail Station to reflect current travel trends (to supplement initial origin destination data analysis findings);
- Establish future base conditions for the development by either performing turning movement counts at key intersections after the completion of infrastructure improvements or by critically assessing and modelling infrastructure improvement impacts on relevant portions of the road network; and
- Analyse the impact of the proposed development on the traffic network with mitigation measures to inform the design of the development in an iterative process.

Beyond the steps needed to complete a thorough Transport Assessment, it is recommended that the mitigation measures be further examined irrespective of the development as they will support other developments and benefit other areas within Medway. Key mitigation measures include:

- A review of bus facilitation, train frequencies, and bike share schemes;
- A parking strategy for Medway;

- Interim review of the Local Transport Plan;
- Maximising parking assets through parking guidance technological solutions;
- Travel behaviour studies to understand key traffic issues and how Medway can better serve its residents;
- Expansion of traffic monitoring capabilities; and
- Upgrades to the traffic signal control system.

Appendix A – Surrounding Developments

Strood Riverside 2

Existing Conditions

In this Transport Assessment, an overview of the traffic counts were analysed as well as a more in-depth analysis using LINSIG.

Based on the report, the observed traffic patterns and traffic counts showed that:

- The heaviest movements within the area are the east / west through movements along High Street and approach or operate over practical capacity during peak periods. Significant westbound queues were observed at the Canal Road / High Street / Esplanade intersection, which were due to high volumes. Queueing vehicles often waited more than one cycle to clear the intersection;
- The left turn from Station Road to High Street also carries significant volumes and operates at practical capacity during the PM peak period;
- The majority of traffic exiting Canal Road (~80%) turns right onto High Street. Canal road operates below capacity in both peak periods;
- The total number of vehicles entering Canal road was higher during the AM peak period than the number of vehicles exiting during the PM peak period. This suggests that pattern of those parking at the station is more dominant than the residential traffic at Kingswear Gardens; and
- The number of vehicles exiting Esplanade is generally low.

Development, Trip Generation, and Trip Distribution

The development involves 350 homes with access to Canal Road. In generating trips, the following assumptions were made:

- Trips generated by the development are added to the network based on existing flows (i.e. if 30% of existing traffic exiting Canal Road turned left, then 30% of future volumes would also turn left);and
- Existing site has no trips.

The parameters input to TRICS were:

- Land Use: 03-Residential
- Days: Monday – Friday
- Year: 2008 to Present
- Category: A – Houses Privately Owned
- Size: 100 to 400 units

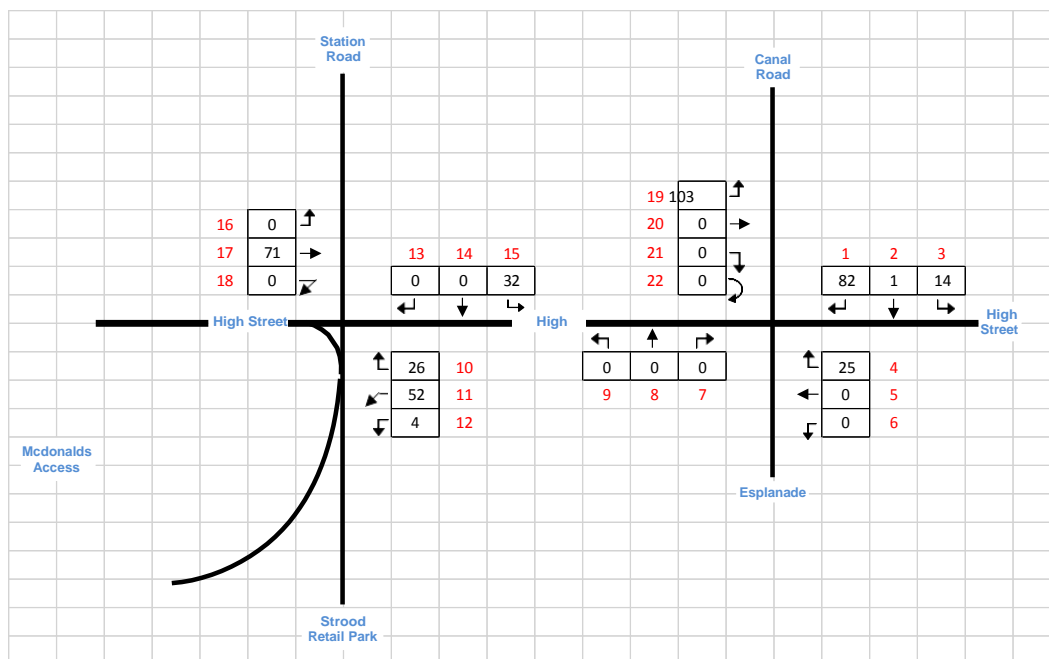
Which resulted in peak period trip rates per dwelling:

			ARRIVALS			DEPARTURES			TOTALS
			Trip	No.	Ave.	Trip	No.	Ave.	
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	Rate
08:00-09:00	6	196	0.148	6	196	0.433	6	196	0.581
17:00-18:00	6	196	0.364	6	196	0.233	6	196	0.597

The resulting trips generated for the development are summarised in:

Site	n of dwellings	Am Peak		Pm Peak	
		in	out	in	out
Strood riverside (Canal rd)	350	52	152	127	82

It was found that the actual number of vehicles used in the analysis was greater than those in the turning movement count. The number of “in” trips corresponds with 350 dwellings but the number of “out” trips corresponds with 414 dwellings. The distribution of these trips are shown below.



Future Conditions

Based on the Development Traffic and the Existing Conditions volumes, a Future Conditions scenario was produced and analysed based on the summation of the existing conditions and development traffic. No changes were made to intersection geometry or signals (with the exception of optimising stage durations). The analysis results showed that in general:

- Operations along High Street would worsen during both peak periods; and
- Turning movements from Canal Road will operate over practical capacity with significant queueing in both peak periods;

Commissioner's Place

Existing Conditions

The site visit found that 85th percentile speeds (both directions) were between 35.5 mph and 36.2 mph, which is over the posted speed limit of 30 mph. Morning and afternoon peak periods were found to be from 07:30 to 9:00 and 16:15 to 17:45, respectively.

In the three year period for which collision data were provided, only two collisions were reported, both of which were categorised as "slight" and between only motor vehicles. There were not enough collisions to identify any collision trends under existing collisions.

Development & Trip Generation

The 130 dwelling development is composed of 70 houses and 60 flats. The site is to be accessed via Commissioner's Road, with pedestrian and cycle access to adjacent side streets to reduce travel distance to local amenities. An additional entry to the site is provided for emergency vehicle access, but has a barrier to prevent general traffic access.

Traffic calming measures along Commissioner's Road, in the form of new buildouts, are proposed to address excessive speeding.

Cycle and vehicle parking provisions are as per Medway Council Interim Residential Parking Standards. Parking for flats are provided by parking courts, while house parking is provided by individual plots. Visitor parking bays are provided for on-street.

The site is currently empty and generates no vehicle trips. TRICS was used to determine the number of trips using the following criteria:

- Sites in England outside Greater London, Wales and Scotland
- 70 to 190 units
- Surveys from 2008 onwards
- Excludes sites with a high proportion of bungalows
- Suburban area (out of town centre)

The development will have a high proportion of flats (46%) and up to 25% of the total development will include affordable housing units. Both of these factors would typically lead to lower trip rates than houses but were not discounted to ensure a robust assessment. The resulting trip rates per dwelling by mode, based on four sites, are as follows:

MULTIMODEL AVERAGE TRIP RATES						
	AM Peak			PM Peak		
Trips per dwelling	Arriving	Departing	Total	Arriving	Departing	Total
Car Drivers	0.139	0.403	0.542	0.347	0.191	0.537
Car Passengers	0.027	0.134	0.161	0.091	0.051	0.142
Pedestrians	0.081	0.243	0.323	0.149	0.045	0.194
Cyclists	0.004	0.011	0.014	0.027	0.011	0.038
Public Transport	0.002	0.018	0.021	0.036	0.003	0.039

The report recognises that given the proximity of the development to Strood Rail Station, the likelihood of a trip being made by rail may be higher; however, the public transport trip rate was not altered.

Census 2011 travel-to-work data was used to determine trip distribution for vehicles. Other trip distributions were based on Google Maps suggested routes.

Future Conditions

The future horizon analysed was 2021, which is the expected completion date for the development. "Tempro" factors (1.0666 and 1.0700 for AM and PM peak periods, respectively) were applied to 2016 count data to establish 2021 background traffic. The AM and PM peak periods analysed were 07:30 to 9:00 and 16:15 to 17:45, respectively. The traffic impacts at three junctions were tested using PICADY including:

- Commissioner's Road / Site Access;
- A228 / Station Road; and
- A289 / Anthony's Way.

The PICADY results showed that impact of the development would be minimal and fall within the limit of daily traffic variation. The report also mentions that capacity improvements at the roundabouts will be in place by 2018 which will provide additional capacity for the local highway network servicing the development.

Conclusions & Recommendations

The proposed development with car parking in accordance with the parking standards is not expected to significantly impact the local road network, especially with respect to future committed improvements. No further recommendations were given.

Appendix B – Policy Summaries

Chatham Town Centre and Public Realm Package

The aim of the scheme is to improve access, especially for people with mobile difficulties, on links between Chatham railway station, Chatham centre, and the waterfront area and areas of employment, retail, and education. Furthermore, it will serve as an attractive gateway to the centre of Medway for visitors, students, employees, and residents. The 0.5 km corridor between Chatham centre and railway station will see improved cycling and pedestrian routes, traffic management measures, and way-finding. Additionally, the scheme integrates with recently complete improvements such as the Chatham Waterfront Bus Station, reconfiguration of the road network to improve accessibility to the river, and the refurbished Sun Pier and Pontoon.

Medway Council has been identified as the Most Improved Local Authority in terms of cycling, walking, and public transport (especially through real-time information at bus stops), and among the top five in combatting road congestion and safety. The Chatham Town Centre aims to carry on the momentum of the improvements achieved so far while connecting to other growth projects such as the river taxi from the Sun Pier and Pontoon as well as the river walk works. These improvements are expected to shift mode splits from automobile to other sustainable modes (i.e. walking, cycling, river taxi) which will divert vehicles from town centre areas (including that of Strood) which would impact the road network adjacent to the development.

A289 Four Elms Roundabout to Medway Tunnel Journey Time and Network Improvements

The scheme consists of three roundabouts (Four Elms, Sans Pareil, and Anthony's Way) on the A289 corridor between Junction 1 of the M2 and Medway Tunnel. This corridor intersects the A228 from the Hoo Peninsula, which has been established as an area of growth by SEEDA's vision for the Thames Gateway. Currently, the roundabouts serve approximately 5000 vehicles per hour during peak periods. In order to accommodate future growth, the scheme will enlarge each roundabout to provide additional carriageway space with entry lanes and free flow slips. The scheme also includes installing new traffic signals on the eastbound entrance to Medway Tunnel and adjusting traffic signals on Maritime Way to operate in conjunction with the new signals.

The scheme is expected to reduce traveller congestion through road junction delay savings and improve journey reliability. As a result of these improvements, it is anticipated that the A289 would become a more attractive option to drivers travelling west rather than via Rochester and Strood Town Centres. Subsequently, traffic at the intersections that would serve the Strood River Regeneration developments would be decreased. The impact of this scheme would need to be confirmed by transport model.

Medway City Estate Connectivity Improvement Measures

The current access situation to Medway City Estate (MCE), where approximately 5,000 people are employed, is not considered sustainable. There is only one main entrance to its north side and a smaller alternative entrance to the west side. Key goals include instigating greener and more efficient modes of transport to the Estate while maintaining continued growth of MCE, as well as reducing the impact of peak-time traffic flow.

One option under consideration is a river taxi from MCE to Chatham town centre, which would also include a new landing stage on the River Medway at MCE. The taxi would use the Sun Pier in Chatham town centre, which underwent refurbishment in 2013 to enable it to accommodate river vessel / taxi passengers. Additionally, the scheme will provide new and enhanced routes through MCE for pedestrians and cyclists, along with cycle parking, benches, and a riverside walk with traffic management to connect the Sun Pier and Chatham town centre. This scheme also integrates with other LEP projects such as the Chatham Town Centre, Chatham Railway Station Improvements, and A289 Four Elms Roundabout to Medway Tunnel.

Of the approximately 5,000 people employed within MCE (Census 2011 Travel to Work), a tremendous proportion travel by car (87%), while 3% arrive by bus and 3% arrive by train. These improvements will help to shift the modal split away from travelling by car, thereby reducing traffic to and from MCE which uses the same road networks as the potential SRR development would. This decreased usage would provide additional traffic buffer capacity that could help to accommodate the potential development traffic.

Strood Town Centre Journey Time and Accessibility Enhancements

Mobility issues (inefficient operation of the transport network, MCE traffic, limited cycling facilities, and inconvenient pedestrian access) are a barrier to growth for Strood resulting in deprivation and unemployment. Improving accessibility and creating a more sustainable network through modal shift will help to establish conditions that will act as a catalyst to increase capacity of current and future development opportunities. The scheme addresses issues through an integrated package of improvements including:

- Access improvements to regeneration sites at Strood Riverside and the former Civic Centre site, to facilitate development of these sites,
- Urban realm and environmental improvements;
- Town Centre traffic management improvement measures;
- Pedestrian and cycling accessibility;

Upgrades and recalibration of the SCOOT system, introduction of VMS, and road capacity improvements are expected to reduce delays by 5 to 12% and accommodate higher volumes. Improvements to public transport such as bus real-time information, bus stop improvements, and train station improvements which are passenger focused are expected to increase usage and improve user experience.

Improvements to walking and cycling are aimed at encouraging increased use of these modes and include: the completion of a main cycle route through the town (including commuter links), cycle parking, wider footpaths, better signing, additional lighting on walking routes, improved walk/cycle links to the station, and improved crossing facilities.

Subsequently, these improvements are expected to result in safety benefits. Travel to work 2011 data showed that 72% of those living in Strood travel less than 20 km to work. However, in Strood Town Centre, 44% of the population will travel to work by driving a car or van, 8% by public transport, 6% by foot, and 1% by cycling. The data suggests that there is a current over-dependence on the car as a mode of transport and that other more sustainable modes have a strong potential.

Key preliminary design details include:

- Conversion of Cuxton to a two-way road so that vehicles travelling east to west can avoid High Street; and
- Removal of signals at Commercial Road at Knight Road and provision of dedicated slip for vehicles entering Commercial Road from Knight Road. The slip is expected to reduce traffic queues.

As it is one of the main objectives of £9 million Strood Town Centre Journey Time and Accessibility Enhancements to facilitate the Strood Riverside Regeneration and former Civic Centre developments, it would be unreasonable to assume that it would not have a significant positive impact on transport and accessibility of the sites. The infrastructure plan is expected to encourage mode shift towards non-car modes as well as provide additional capacity for those whom making a trip by car is necessary.

Medway Cycling Action Plan

Following the Cycling Delivery Plan published by the Department for Transport in October 2014, Medway Council is providing leadership and vision at a local level to develop a cycling culture in Medway. The Action Plan aims to expand and improve the cycling network to provide safe and attractive facilities that will result in reduced journey times and safety

improvements. In addition to health and environmental benefits, the Plan aims to contribute to local economic growth by making the local road network operate more efficiently during periods of congestion. Funds will be used towards improvements to the National Cycle Network, utility cycling, cycle parking (with a focus at rail stations), promoting Active Medway Cycle Groups, school training, regional facilities, as well as information and promotion.

Historic data has demonstrated a 17% increase in cycle journeys on Medway's cycle network between 2009 and 2014. Furthermore, data has shown that cycle parking at rail stations has increased significantly and is generally at capacity. These trends indicate that cycling is gaining traction as a mode of transport in Medway, which are expected to increase further with Medway Cycling Action Plan. Consequently, a modal shift towards cycling will reduce the traffic impact of the regeneration development.

Public Rights of Way Improvement Plan

The Public Rights of Way Improvement Plan (RoWIP), beginning in 2007, aims to ensure that the Rights of Way meets current and future needs whilst promoting access for all. The priorities for delivery include:

- Clean and green environment – improving quality and public realm as well as access to the countryside;
- Safer communities – reducing fear of crime by opening up enclosed routes where possible;
- Providing opportunities for exercise and access to the countryside for youth, elderly, and vulnerable populations;
- Improve accessibility and easy travelling in Medway;
- Regeneration through improvements to existing routes and creation of new routes in conjunction with developments.

The plan is scheduled to be completed in 2017, which means that by the time the development is completed, the Public Rights of Way (PROW) should be more attractive for users of all modes, including cycling, pedestrians, and transit. This could reduce the overall car demand in the area, lowering the DOS found at key intersections near the development.

Appendix C – In-flight Initiatives Details

Chatham Town Centre and Public Realm Package

The aim of the scheme is to improve access, especially for people with mobile difficulties, on links between Chatham railway station, Chatham centre, and the waterfront area and areas of employment, retail, and education. Furthermore, it will serve as an attractive gateway to the centre of Medway for visitors, students, employees, and residents. The 0.5 km corridor between Chatham centre and railway station will see improved cycling and pedestrian routes, traffic management measures, and way-finding. Additionally, the scheme integrates with recently complete improvements such as the Chatham Waterfront Bus Station, reconfiguration of the road network to improve accessibility to the river, and the refurbished Sun Pier and Pontoon.

Medway Council has been identified as the Most Improved Local Authority in terms of cycling, walking, and public transport (especially through real-time information at bus stops), and among the top five in combatting road congestion and safety. The Chatham Town Centre aims to carry on the momentum of the improvements achieved so far while connecting to other growth projects such as the river taxi from the Sun Pier and Pontoon as well as the river walk works. These improvements are expected to shift mode splits from automobile to other sustainable modes (i.e. walking, cycling, river taxi) which will divert vehicles from town centre areas (including that of Strood) which would impact the road network adjacent to the development.

A289 Four Elms Roundabout to Medway Tunnel Journey Time and Network Improvements

The scheme consists of three roundabouts (Four Elms, Sans Pareil, and Anthony's Way) on the A289 corridor between Junction 1 of the M2 and Medway Tunnel. This corridor intersects the A228 from the Hoo Peninsula, which has been established as an area of growth by SEEDA's vision for the Thames Gateway. Currently, the roundabouts serve approximately 5000 vehicles per hour during peak periods. In order to accommodate future growth, the scheme will enlarge each roundabout to provide additional carriageway space with entry lanes and free flow slips. The scheme also includes installing new traffic signals on the eastbound entrance to Medway Tunnel and adjusting traffic signals on Maritime Way to operate in conjunction with the new signals.

The scheme is expected to reduce traveller congestion through road junction delay savings and improve journey reliability. As a result of these improvements, it is anticipated that the A289 would become a more attractive option to drivers travelling west rather than via Rochester and Strood Town Centres. Subsequently, traffic at the intersections that would serve the Strood River Regeneration developments would be decreased. The impact of this scheme would need to be confirmed by transport model.

Medway City Estate Connectivity Improvement Measures

The current access situation to Medway City Estate (MCE), where approximately 5,000 people are employed, is not considered sustainable. There is only one main entrance to its north side and a smaller alternative entrance to the west side. Key goals include instigating greener and more efficient modes of transport to the Estate while maintaining continued growth of MCE, as well as reducing the impact of peak-time traffic flow.

One option under consideration is a river taxi from MCE to Chatham town centre, which would also include a new landing stage on the River Medway at MCE. The taxi would use the Sun Pier in Chatham town centre, which underwent refurbishment in 2013 to enable it to accommodate river vessel / taxi passengers. Additionally, the scheme will provide new and enhanced routes through MCE for pedestrians and cyclists, along with cycle parking, benches, and a riverside walk with traffic management to connect the Sun Pier and Chatham town centre. This scheme also integrates with other LEP projects such as the Chatham Town Centre, Chatham Railway Station Improvements, and A289 Four Elms Roundabout to Medway Tunnel.

Of the approximately 5,000 people employed within MCE (Census 2011 Travel to Work), a tremendous proportion travel by car (87%), while 3% arrive by bus and 3% arrive by train.

These improvements will help to shift the modal split away from travelling by car, thereby reducing traffic to and from MCE which uses the same road networks as the potential SRR development would. This decreased usage would provide additional traffic buffer capacity that could help to accommodate the potential development traffic.

Strood Town Centre Journey Time and Accessibility Enhancements

Mobility issues (inefficient operation of the transport network, MCE traffic, limited cycling facilities, and inconvenient pedestrian access) are a barrier to growth for Strood resulting in deprivation and unemployment. Improving accessibility and creating a more sustainable network through modal shift will help to establish conditions that will act as a catalyst to increase capacity of current and future development opportunities. The scheme addresses issues through an integrated package of improvements including:

- Access improvements to regeneration sites at Strood Riverside and the former Civic Centre site, to facilitate development of these sites,
- Urban realm and environmental improvements;
- Town Centre traffic management improvement measures;
- Pedestrian and cycling accessibility;

Upgrades and recalibration of the SCOOT system, introduction of VMS, and road capacity improvements are expected to reduce delays by 5 to 12% and accommodate higher volumes. Improvements to public transport such as bus real-time information, bus stop improvements, and train station improvements which are passenger focused are expected to increase usage and improve user experience.

Improvements to walking and cycling are aimed at encouraging increased use of these modes and include: the completion of a main cycle route through the town (including commuter links), cycle parking, wider footpaths, better signing, additional lighting on walking routes, improved walk/cycle links to the station, and improved crossing facilities.

Subsequently, these improvements are expected to result in safety benefits. Travel to work 2011 data showed that 72% of those living in Strood travel less than 20 km to work. However, in Strood Town Centre, 44% of the population will travel to work by driving a car or van, 8% by public transport, 6% by foot, and 1% by cycling. The data suggests that there is a current over-dependence on the car as a mode of transport and that other more sustainable modes have a strong potential.

Key preliminary design details include:

- Conversion of Cuxton to a two-way road so that vehicles travelling east to west can avoid High Street; and
- Removal of signals at Commercial Road at Knight Road and provision of dedicated slip for vehicles entering Commercial Road from Knight Road. The slip is expected to reduce traffic queues.

As it is one of the main objectives of £9 million Strood Town Centre Journey Time and Accessibility Enhancements to facilitate the Strood Riverside Regeneration and former Civic Centre developments, it would be unreasonable to assume that it would not have a significant positive impact on transport and accessibility of the sites. The infrastructure plan is expected to encourage mode shift towards non-car modes as well as provide additional capacity for those whom making a trip by car is necessary.

Medway Cycling Action Plan

Following the Cycling Delivery Plan published by the Department for Transport in October 2014, Medway Council is providing leadership and vision at a local level to develop a cycling culture in Medway. The Action Plan aims to expand and improve the cycling network to provide safe and attractive facilities that will result in reduced journey times and safety improvements. In addition to health and environmental benefits, the Plan aims to contribute to local economic growth by making the local road network operate more efficiently during

periods of congestion. Funds will be used towards improvements to the National Cycle Network, utility cycling, cycle parking (with a focus at rail stations), promoting Active Medway Cycle Groups, school training, regional facilities, as well as information and promotion.

Historic data has demonstrated a 17% increase in cycle journeys on Medway's cycle network between 2009 and 2014. Furthermore, data has shown that cycle parking at rail stations has increased significantly and is generally at capacity. These trends indicate that cycling is gaining traction as a mode of transport in Medway, which are expected to increase further with Medway Cycling Action Plan. Consequently, a modal shift towards cycling will reduce the traffic impact of the regeneration development.

Public Rights of Way Improvement Plan

The Public Rights of Way Improvement Plan (RoWIP), beginning in 2007, aims to ensure that the Rights of Way meets current and future needs whilst promoting access for all. The priorities for delivery include:

- Clean and green environment – improving quality and public realm as well as access to the countryside;
- Safer communities – reducing fear of crime by opening up enclosed routes where possible;
- Providing opportunities for exercise and access to the countryside for youth, elderly, and vulnerable populations;
- Improve accessibility and easy travelling in Medway;
- Regeneration through improvements to existing routes and creation of new routes in conjunction with developments.

The plan is scheduled to be completed in 2017, which means that by the time the development is completed, the Public Rights of Way (PROW) should be more attractive for users of all modes, including cycling, pedestrians, and transit. This could reduce the overall car demand in the area, lowering the DOS found at key intersections near the development.

Appendix D – Parking Standards

Medway Parking Standards

C3 Residential dwellings *		
Dwelling size	Minimum number of car parking spaces per dwelling	Minimum number of cycle parking spaces per dwelling
1 bedroom	1.0 ^{(1) (2)}	1.0 ⁽⁴⁾
2 bedrooms	1.5 ^{(1) (2)}	1.0 ⁽⁴⁾
3 bedrooms & above	2.0 ^{(1) (2)}	1.0 ⁽⁴⁾
Visitor parking	0.25 ⁽³⁾	0
<p>Notes</p> <ol style="list-style-type: none"> 1 Reductions of the standard will be considered if the development is within an urban area that has good links to sustainable transport and where day-to-day facilities are within easy walking distance. 2 Excludes garage if less than 7m x 3m internal dimension. 3 Applies to a minimum threshold of 4 residential units. Requirement for provision is rounded down, i.e. 5 to 7 units require 1 visitor space, 8 to 11 units require 2 spaces, etc. Visitor or unallocated vehicle parking can, subject to appropriate design, be located on or near the road frontage. 4 Not required if garage or secure area is provided within curtilage of dwelling 		

Gravesham Parking Standards

Maximum Vehicle Parking Standards

Car Parking	
1 bedroom	1 space per dwelling
2 and 3 bedrooms	2 spaces per dwelling
4 or more bedrooms	3 spaces per dwelling
Sheltered Accommodation	1 space per resident warden + 1 space per 2 units
Notes:	<p>1. For 1-bedroom dwellings the parking will usually be provided as communal spaces. For other dwelling sizes part or all of the parking can be provided on a communal basis.</p> <p>2. The level of car parking provision includes any garages, provided as an integral part of the dwelling or within its curtilage, and/or driveways provided within the curtilage, subject to the preferred sizes set out in Appendix B.</p>

Minimum Cycle Parking Standards

Individual residential dwellings ⁽¹⁾	1 space per bedroom
Flats & maisonettes ⁽²⁾	1 space per unit
Sheltered accommodation ⁽²⁾	1 space per 5 units
Notes:	<p>1. Cycle parking provision should normally be provided within the curtilage of the residential dwelling. Where a garage is provided it should be of a suitable size to accommodate the required cycle parking provision.</p> <p>2. Parking provision should be provided as a secure communal facility where a suitable alternative is not available.</p>

Kent County Council Parking Standards

GUIDANCE TABLE FOR RESIDENTIAL PARKING

LOCATION	CITY/TOWN CENTRE	EDGE OF CENTRE	SUBURBAN
ON-STREET CONTROLS	On-street controls preventing all (or all long stay) parking	On-street controls, residents' scheme and/or existing saturation (Note 3)	No, or very limited, on-street controls
NATURE OF GUIDANCE	MAXIMUM (Note 1)	MAXIMUM	MINIMUM (Note 6)
1 & 2 BED FLATS	1 space per unit	1 space per unit	1 space per unit
FORM	Controlled (Note 2)	Not allocated	Not allocated
1 & 2 BED HOUSES	1 space per unit	1 space per unit	1 space per unit
FORM	Controlled (Note 2)	Allocation possible	Allocation possible
3 BED HOUSES	1 space per unit	1 space per unit	1.5 spaces per unit
FORM	Controlled (Note 2)	Allocation possible	Allocation of one space per unit possible
4+ BED HOUSES	1 space per unit	1.5 spaces per unit	2 independently accessible spaces per unit
FORM	Controlled (Note 2)	Allocation of one space per unit possible	Allocation of both spaces possible (Note 7)
ARE GARAGES ACCEPTABLE? (Note 4)	Yes, but with areas of communal space for washing etc.	Yes, but not as a significant proportion of overall provision	Additional to amount given above only
ADDITIONAL VISITOR PARKING (Note 5)	Public car parks	Communal areas, 0.2 per unit maximum	On-street areas, 0.2 per unit

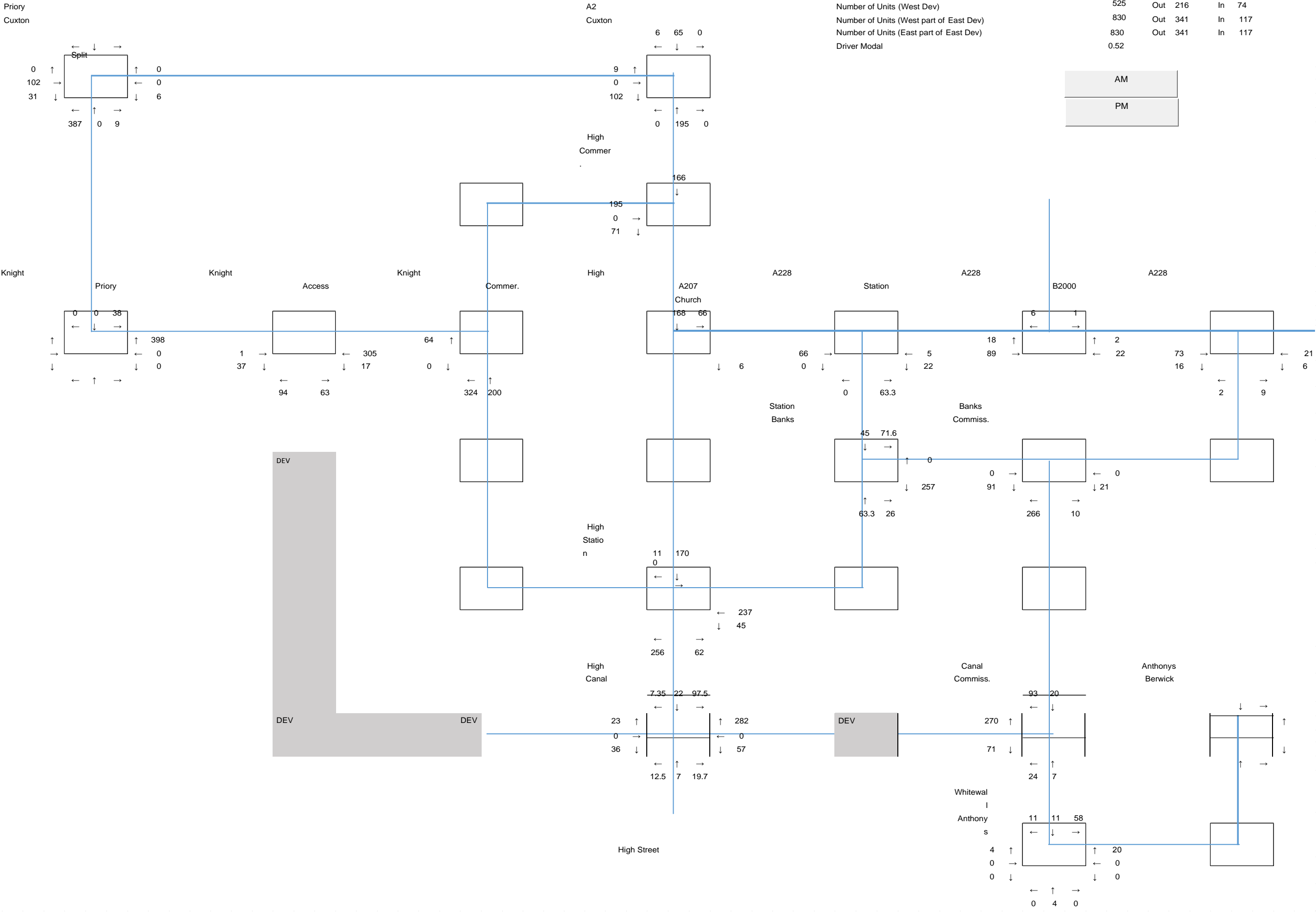
NOTES

1. Reduced, or even nil provision is encouraged in support of demand management and the most efficient use of land.
2. Parking/garage courts, probably with controlled entry.
3. Reduced, or even nil provision acceptable for rented properties, subject to effective tenancy controls.
4. Open car ports or car barns acceptable at all locations, subject to good design.
5. May be reduced where main provision is not allocated. Not always needed for flats.
6. Lower provision may be considered if vehicular trip rate constraints are to be applied in connection with a binding and enforceable Travel Plan.
7. Best provided side by side, or in another independently accessible form. Tandem parking arrangements are often under-utilised.

Appendix E – Trip Distribution

AM PEAK – Note: trips can also be distributed to Gun Lane.

Priory
Cuxton



PM PEAK

Priory
Cuxton

A2
Cuxton

Number of Units (West Dev)
Number of Units (West part of East Dev)
Number of Units (East part of East Dev)
Driver Modal

525	Out	92	In	168
830	Out	146	In	265
830	Out	146	In	265
0.52				

AM
PM

