

Arup Consulting Engineers

Cork County Council

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**Passage West Traffic  
and Parking Study**

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Traffic and Parking Study  
Report

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Traffic and Parking Study Report

November 2005

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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## EXECUTIVE SUMMARY

Arup Consulting Engineers (Arup) were commissioned by Cork County Council to prepare a traffic and parking study for the town of Passage West, Co. Cork. Passage West is located approximately 10 km to the south east of Cork City.

Currently Passage West suffers some traffic congestion in the middle of the town and particularly in the vicinity of Main Street and Back Street. The majority of the delays experienced by motorists in the town are primarily down to the extent of unauthorised parking in the centre of the town. The lack of convenient parking within the centre of the town requires many of the drivers visiting the facilities within the town to park illegally on the roadside which delays through traffic.

A review of the current traffic management system in the town was undertaken. A number of different junction layouts for the main junction within the town were assessed. It is recommended that in the short/medium term the current traffic management system should be retained and updated to include the following improvements, increased parking stock, improved pedestrian connectivity between parking areas and retail units, improved restrictions to parking and improved junction control at the junction of Chapel Street/ Back Street.

In order to assess the parking demand in the town parking surveys were undertaken. These surveys indicated that the commercial centre of Passage West would benefit greatly from the provision of additional parking spaces. A potential new car park site has been identified on Beach Road. This site has a number of benefits, it is located within a very short walking distance of Strand Street, the site is large and could potentially accommodate a relatively large number of parking spaces to serve the town. It is recommended that this site is purchased by the council, for the provision of a car park.

As part of the improved traffic management system in the town, it is also recommended to improve pedestrian facilities. The pedestrian connectivity should be enhanced between the car parking spaces outside Haulbowline Industries and the retail units on Strand Street, by providing pedestrian access through the public park on Strand Street. It is also recommended to provide dropped kerbs and tactile paving on the northern section of Back Street and Main Street to facilitate people travelling between the new credit union on the corner of Back Street/ Chapel Square and the new car park located on the site of the old firehouse.

An assessment of the operation of the proposed junction layouts was undertaken, this assessment indicates that at present the main junction currently operates within capacity. However it is noted that if significant development takes place to the south of the junction, then the junction will begin to operate close to capacity particularly in the evening peak period. This is due to the fact that traffic travelling south on Main Street has to yield before passing through the junction.

In order to accommodate the expansion of the Passage West/ Monkstown area the following traffic management improvement measures should be further investigated:

- The construction of a new road to the west of Passage which will connect the residential area of Church Hill with the Rochestown Road. This roadway will also provide an alternative route to Douglas/ Cork for those living to the west of both Monkstown and Glenbrook.
- The demolition of the buildings between Main Street and Back Street and the realignment of the main street to form a standard two lane roadway

## 1. INTRODUCTION

### 1.1 Brief

Arup Consulting Engineers (Arup) were commissioned by Cork County Council to prepare a traffic and parking study for the town of Passage West, Co. Cork.

The brief for the project includes the following issues to be addressed as part of the study:

- To undertake a study of traffic in the urban area to determine existing and future traffic flows on the road network
- Determine the capacity of the road network
- Analyse junction capacity and make recommendations in relation to junction improvements, which would maximise junction capacity whilst maintaining, or improving road safety for all users.

This study will also consider the following issues.

- Traffic flow regulation
- Provision of additional parking
- Provision of pedestrian crossings and facilities
- Determination of car park demand for on-street and designated public car parks
- Identification of delivery requirements within the town
- Recommend improvements to enhance the bus service and public transport facilities within the town.
- Investigate the potential for a park and ride facility in the town.

### 1.2 Structure of Report

The structure of this report is as follows:-

- Section 2 This section reviews the existing situation in Passage West
- Section 3 This section explores the potential junction options for in and around Main Street
- Section 4 This section assesses the parking demand within the town and explores different options for increasing parking demand
- Section 5 This section reviews pedestrian facilities in Passage West
- Section 6 This section analyses the operational capacity of proposed upgraded junction options

## **2. EXISTING SITUATION**

### **2.1 General**

Passage West is located to the south east of Cork City and is within 10 kilometres of Cork City. The town is served by one primary route which runs through the middle of the town with numerous accesses off this roadway serving both the residential areas of Passage West along with the commercial premises within the centre of the town.

The main route within Passage West is primarily two-way with the exception of the area close to the centre where due to the existing building layout traffic is carried by two one-way streets. Main Street which is a one-way street carries traffic wishing to enter the town from Cork City while Back Street carries traffic exiting the town.

Currently Passage West suffers some traffic congestion in the middle of town and particularly in the vicinity of Main Street and Back Street. The majority of the delays experienced by motorists in the town are primarily down to the extent of unauthorised parking in the centre of the town. Due to the lack of convenient parking within the town many of the drivers visiting the facilities within the town park illegally on the roadside which delays through traffic.

### **2.2 Local Road Network**

The roads located in close proximity of the study area are described below. The local road network can be seen in the attached drawing SK004.

#### **2.2.1 Main Street (R610)**

Main Street carries all southbound traffic through the town centre. The roadway is of a narrow width along sections where it runs parallel to Back Street, particularly on the approach to the junction with Strand Street/ Railway Street. A footpath is provided along the eastern side of the road and parking is prohibited along this section and is regulated by double yellow lines, however it is noted from site visits that illegal parking occurs on this side particularly outside the AIB bank and the post office. On the western side of the roadway it is noted that parking is present although it is not designated by way of markings. On the western side of the roadway at both the north and south end of the section which runs parallel to Back Street double yellow lines are present, however it is noted that parking frequently takes place at these points which can lead to small delays for passing traffic.

#### **2.2.2 Back Street (R610)**

Back Street runs parallel to Main Street and serves traffic travelling northbound through the town. Parking is provided on the eastern side of the roadway for most of its length with parking provided on the western side southern section outside the takeaway/café. While it is noted that some unauthorised parking takes place on the section of the western side which is not designated parking, this does not however have an adverse effect on traffic as the road is of a generous width. A footpath is provided along the western side of the road.

#### **2.2.3 Strand Street (R610)**

Strand Street is located to the south of the main junction within the town and carries commuter traffic wishing to travel northbound, to Cork, and southbound, to Monkstown, as well as local traffic. It is noted from site visits that this road suffers greatly from illegal parking, in particular the area surrounding the Gala convenience store and Passage West Credit Union, this parking causes delays and queuing as it effectively reduces the road to one lane with opposing traffic having to yield to each other. Footpaths are provided on both sides of Strand Street and a zebra crossing is located outside Passage West Credit Union.

#### **2.2.4 Railway Street**

Railway Street is a short section of roadway located to the east of the main junction. At present Railway Street is lightly trafficked, however a residential development is currently under construction so traffic levels are likely to increase. It is noted from site visits that the visibility for cars approaching the Main Street/ Strand Street junction is poor due to surrounding buildings.

#### **2.2.5 Church Hill**

Church Hill is located to the west of the Main Street/ Strand Street junction and serves traffic travelling between the town and the local secondary school and a number of residential areas. It is noted from site visits that Church Hill is steep and that pedestrian levels are low as a result, even though footpaths are provided on both sides of the road. It is also noted from site visits that a number of patrons of the takeaway on Back Street park on Church Hill.

#### **2.2.6 Beach Road**

Beach Road approaching its junction with Back Street is extremely narrow in nature and poorly surfaced. This roadway serves a number of different residences along its length. It is noted from site visits that the junction of Back Street/ Strand Street is difficult to manoeuvre due to its skewed nature and narrow width.

### **2.3 Traffic Patterns**

In order to assess the impact of existing traffic on the surrounding road network, an examination of existing traffic flows was necessary. Traffic counts were carried out on Wednesday 20<sup>th</sup> July 2005 between 07:00 – 10:00 and 16:00 – 19:00. These traffic counts were undertaken at the main junction in the town and at the entrance to Haulbowline Industries. The time periods that the traffic counts were conducted over are generally the busiest in terms of traffic generation. The peak hours for traffic were found to be 09:00 – 10:00 and 17:00 – 18:00.

It should be noted that at the time of these surveys that no ships were present in Haulbowline Industries. As a result HGV values within the town are smaller than those expected if a ship was loading/ unloading.

The counts were carried out at the following locations :

- Site 1 Main Street/ Strand Street Junction
- Site 2 Haulbowline Industries

Two-way traffic flows are shown in Table 2.1. Figures in brackets relate to percentage HGV's.

**Table 2.1 Existing Two Way Link Flows**

Link		Year 2005	
		Weekday AM Peak (vehs)	Weekday PM Peak (vehs)
1	Main Street	202 (4.5%)	322(2.5%)
2	Back Street	269 (3.7%)	304(3.3%)
3	Railway Street	12(0%)	17(0%)
4	Strand Street (south of junction)	307 (5.2%)	513(3.3%)
5	Church Hill	195 (2.6%)	223(3.1%)
6	Beach Road	19 (0%)	26 (0%)
7	Strand Street (north of Haulbowline Industries)	316(5.7%)	524(3.4%)
8	Haulbowline Industries Entrance	16 (37.5%)	9(22.2%)
9	Strand Street (south of Haulbowline Industries)	268(3.7%)	487(3.3%)

Source: Count-On-Us

From the above information it can be seen that Strand Street is the busiest street in the vicinity of the town centre with traffic on Main Street, Back Street and Church Hill also recording relatively high traffic flows. Traffic on both Beach Road and Railway Street was noted as being quite low.

With respect to the volume of heavy goods vehicles (HGV) travelling through the town it was noted that a total of 18 trucks travelled along Strand Street in the morning peak period of which 6 were destined for/ originated from Haulbowline Industries, these 18 trucks accounted for 5.2% of traffic on Strand Street. During the evening peak period a total of 18 trucks were recorded on Strand Street with only 2 originating from/ destined for Haulbowline Industries, these 18 trucks accounted for 3.3% of traffic on Strand Street at this time.

An assessment of the percentage of HGV's using Main Street in Carrigaline was undertaken, this indicated that 3% of vehicles utilising Main Street on a weekday morning peak hour are HGV's whilst 2% of vehicles utilising Main Street on a weekday evening peak hour are HGV's. Therefore, the percentage HGV's on Strand Street is slightly greater than the percentage HGV's on main routes in surrounding towns.

As these traffic counts were conducted during the summer it is unlikely that they will be representative of average peak hour flows, thus to account for this the counts have been grown by 15%. This is a conservative estimate as the NRA guidelines indicate that July traffic counts should be grown by 7% to represent average traffic flows. The results of this exercise can be seen in the table below. The factored 2005 traffic flows have been used in the future assessments of any possible traffic management measures

**Table 2.2 Factored Two Way Link Flows**

Link		Year 2005	
		Weekday AM Peak (vehs)	Weekday PM Peak (vehs)
1	Main Street	232(4.5%)	374(2.5%)
2	Back Street	309(3.7%)	350(3.3%)
3	Railway Street	14(0%)	20(0%)
4	Strand Street (south of junction)	353(5.2%)	590(3.3%)
5	Church Hill	224(2.6%)	256(3.1%)
6	Beach Road	22(0%)	30(0%)
7	Strand Street (north of Haulbowline Industries)	363(5.7%)	603(3.4%)
8	Haulbowline Industries Entrance	18(37.5%)	10(22.2%)
9	Strand Street (south of Haulbowline Industries)	308(3.7%)	560(3.3%)

Source: Count-On-Us

## 2.4 Accident Data

The NRA's database for accidents 1996 - 2003 was consulted and it indicated that no accidents of either fatal, serious or a minor nature took place at the main junction within the town (the junction of Main Street/ Strand Street).

However it should be noted that during this period that the junction was of a different layout. Previously traffic originating from Church Hill destined for Strand Road had to turn left into Back Street before turning onto Main Street and then Strand Road.

## 2.5 Public Transport Facilities

Passage West is served by a bus route which operates between Cork and Haulbowline via Passage West and Monkstown. This bus service operates approximately every 15 - 20 minutes during peak periods and 30 minutes during off peak periods. There are a number of bus stops throughout the town. Figure 1 shows the location of the bus stops, the route of the bus service and its five minute wide catchment.

From the attached figure it can be seen that the majority of the town is within a five minute walk of the existing bus route, however the newer housing estates on Church Hill and at Pembroke Woods are located slightly further away but are still within a ten minute walk of the bus stop.

### **3. JUNCTION OPTIONS**

#### **3.1 Existing Junction Layout**

The current junction layout consists of five different entry arms with Back Street serving as an exit only arm and Main Street as an entry only arm. A number of the entry arms to the junction are currently hampered by poor visibility; the arms which are primarily affected by this are Railway Street and Beach Street. Vehicles wishing to exit Railway Street have difficulty seeing traffic approaching from Strand Street; Beach Road also has difficulty viewing traffic approaching from Strand Street due to the fact that they run parallel to each other.

An additional difficulty encountered in the vicinity of the junction relates to unauthorised parking on Main Street. Parking is prohibited at either end of Main Street, this is due to the fact that at the northern end the road is of a narrow nature and at the southern end the road is approaching a junction. However it is evident from site visits that illegal parking takes place at these areas, this leads to delays and congestion in this area as vehicles find it difficult to manoeuvre around the parked vehicles. Similarly to Main Street, Strand Street suffers from unauthorised parking on-street. This is particularly a problem outside the Gala convenience store and Passage West Credit Union.

It is noted from site visits that there are no great difficulties for pedestrians at this junction; this is due to the fact that no natural pedestrian desire lines lie on the wider sections of the junction and that the slow nature of the traffic allows for easier crossing opportunities.

It should be noted that there are a number of advantages associated with the existing junction layout; the most significant of these is that it removes the necessity of cars wishing to travel from Church Hill to Strand Street having to travel north along Back Street before then having to execute a u-turn manoeuvre and turn into Main Street. However the section between Back Street and Strand Street that is two way is irregular and there are concerns that vehicles approaching the junction from Main Street may not yield to this traffic.

#### **3.2 Proposed Junction 1 – Roundabout**

The first proposed junction option consists of creating a roundabout around the building located to the north of Church Hill and south of Railway Street. This would facilitate traffic wishing to travel between Church Hill and Strand Street whilst removing the potentially dangerous two-way section between Main Street and Back Street. The proposed layout of the junction can be seen in the attached drawing SK001.

The proposed junction arrangements will improve the general movement of traffic in the area as all traffic will enter the junction and turn left which will improve general safety and movement in the area.

One difficulty with this system is the turning radius for vehicles wishing to turn onto Main Street from Church Hill/ Strand Street etc is quite tight. The turning radius does not allow large vehicles to make the turn easily and the proposed system is very susceptible to blockage if vehicles park illegally near the junction.

Due to the nature of the traffic and parking habits of the town the above junction system is not recommended because it is liable to be blocked by a combination of unauthorised parked cars and by large vehicles turning within the junction.

### 3.3 Proposed Junction 2 – Four Arm Priority Junction

The second proposed junction layout consists of the removal of one of the one-way streets in Passage, Back Street, and the relocation/ demolition of the two buildings currently located between these two streets. This would allow for the widening of Main Street to accommodate two-way traffic and also the realignment of the street with Strand Street. The realignment of Main Street and Strand Street would allow vehicles wishing to exit Railway Street adequate visibility approaching the junction. This scheme would also include the lengthening of Church Hill to the intersection of the junction; this would include the creation of a priority junction at the junction of Church Hill/ Beach Road. This proposal would culminate in the creation of a four arm priority junction with priority assigned along Main Street/ Strand Street. This scheme would also entail the creation of a small car park (~16 spaces) in the area previously occupied by Back Street, however this proposal would mean that the building currently located immediately to the north of Railway Street/ Church Hill can not be relocated. The proposed layout of the junction can be seen in the attached drawing SK002

The major disadvantage associated with this scheme, is the cost and difficulty involved in acquiring the two buildings between Main Street and Back Street, in addition to the effect on the conservation of the town in terms of preserving the existing built environment. These can be lessened some amount by the offer to relocate the buildings to the west in the area currently occupied by Back Street, however if a car park is provided in this area then it will not be possible to relocate one of the buildings.

Due to the difficult financial and building conservation impact of the proposed traffic management improvement measures it is not recommended to proceed with this scheme in the short to medium term. However, it is noted that the above solution is a usable long term solution for the town and will allow for the future expansion of the town centre.

### 3.4 Proposed Junction 3 – Signalisation of Existing Junction

The option to erect traffic signals at the present junction was also given consideration; however this option was discounted for a number of reasons. Firstly, due to the complex nature of the junction, with its 6 entry arms, signalisation will lead to large delays at each arm while other arms are granted 'green' time. In addition to this each arm will require its own individual green time as it is not possible to run phases together, this further exacerbates the delays possible with the installation of traffic signals.

Added to this the present volume of traffic which passes through this junction does not warrant traffic signals, at present each arm is able to enter the junction without significant delays, this indicates that the junction is more suited to give-way arms than traffic signals.

Finally one of the major benefits associated with the installation of traffic lights is the safety provision they give to pedestrians; however from site visits and our research on accident statistics there does not seem to be a significant issue with respect to pedestrian safety within the town centre. The environment within the centre of the town is generally quite safe for pedestrians as traffic speeds are quite low and the junctions are taken with a certain degree of caution during the day particularly during peak pedestrian times.

### 3.5 Extension of the One-way System

Consideration was given to the possibility of extending the existing one-way system on Main Street and Back Street, to include Strand Street and Beach Road. This system would entail northbound traffic travelling along Beach Road and exiting the town via Back Street, with southbound traffic passing through the town via Main Street and Strand Street. However this system was discounted for the following reasons, due to the acute angle at the southern junction of Strand Street and Beach Road it is extremely difficult to turn into Beach Road

from Strand Street. Similarly at the northern junction of Beach Road and Strand Street it is difficult for large volumes of traffic to travel from Beach Road to Strand Street. In addition to the above mentioned operational difficulties it was felt that due to the relatively long sections of roadway involved that if they were designated one-way then drivers may negotiate these roadways at both fast and unsafe speeds.

### 3.6 Existing Traffic Management System Updated

After reviewing a number of alternative traffic management options it is recommended that in the short to medium term that the present traffic management system continues but that it includes the following improvements.

- Improved signage throughout the town
- Increased parking stock in the general environs.
- Improved pedestrian connectivity between the parking area adjacent to the Haulbowline Industries and the Gala convenience store.
- Improved restrictions to the parking at critical locations.
- Improved pedestrian connectivity between the proposed new car park on the grounds of the former fire station and the new credit union building.
- Improved junction control at the junction of Chapel Street/ Back Street.
- Introduction of a pedestrian crossing and traffic calming on Church Hill.
- Improved set down/ pick up facilities within the town.

The following drawing, SK003 shows the proposed improvement measures for the existing road traffic management plan.

The proposed traffic management plans include the provision of set down areas which can be used by deliveries, however there may be some benefit in providing an informal restriction on deliveries between 16:00 – 19:00 in the evening. This informal restriction will ensure that during the busiest period the main streets in the town are free from deliveries. This restriction will require the co-operation of all traders along the main streets.

### 3.7 Further Recommendations to Improve Traffic Flow in Passage West

A number of further improvements are recommended which if implemented would lead to improved traffic operation within Passage West.

#### 3.7.1 Strand Street Opposite Passage West Garda Station

The first recommendation relates to the section of roadway outside the Kearney's Coach Hire yard which is located to the South of Passage West town centre opposite Passage West Garda Station. At present this section of roadway is of a narrow nature, it is recommended that if Kearney's yard came on the market that a section of the yard be acquired to widen the existing roadway.

#### 3.7.2 Railway Street

The second recommendation relates to Railway Street. At present Railway Street is of a narrow nature and the junction of Railway Street and Main Street/ Strand Street suffers from extremely poor visibility. Therefore, it is recommended that following the construction of the roadway connecting the new car park, at the site of the old firehouse, via Steampacket Quay to

Railway Street, that consideration be given to converting Railway Street to a one-way eastbound only street. This measure will improve traffic flows at the Main Street junction.

### **3.7.3 Existing Car Park North of the Town Library**

This recommendation relates to the section of roadway outside the car park located to the north of the town library. At present this car park is under utilised, whilst conversely the section of road immediately outside the car park is heavily used for on-street parking. Therefore it is recommended that consideration be given to providing double yellow lines on the section of roadway outside the car park. The provision of double yellow lines will result in the more efficient use of the existing car park and will ensure that the section of roadway immediately outside the car park does not suffer from congestion caused by parked cars. Pedestrian access into the car park could be improved by providing additional access points into the car park from both its southern and northern ends.

### **3.7.4 Junction of Church Hill/ St. Peters Secondary School**

The existing junction is quite wide and actual rights of way are poorly defined. It is recommended to realign the junction to reinforce the priority along Church Hill and provide standard yield signs to the two adjoining side roads.

## 4. PARKING

### 4.1 General

In order to assess the parking demand within the town of Passage West parking surveys were undertaken from 12:00 – 13:30 on Thursday the 28<sup>th</sup> of July 2005 and from 08:30 – 09:00 on Friday the 29<sup>th</sup> of July 2005. The area of the town which was surveyed stretches from the Boys National School to the north of the town right along the main road through the town and as far as the Ferry at Glenbrook. For simplicity the areas surveyed have been split into three different sections, the first section consists of the area to the north of the town stretching from the Boys National School as far as the Library Car Park, the second section consists of the Central Business District of the town consisting of the main streets, and the third section consists of the area to the south of the town as far as the ferry at Glenbrook. These areas are indicated on figure 2.

In the parking study the volume of available/ potential parking spaces as well as the number of cars parked was recorded. The results of the survey can be seen in Table 4.1 below.

**Table 4.1 Parking Survey**

Area	Thursday 12:00 – 13:30		Friday 08:30 – 09:00	
	No. of Cars Parked	No. of Available Spaces	No. of Cars Parked	No. of Available Spaces
North of Town	40	122	57	122
CBD	74	89	59	89
South of Town	51	149	58	149

Source: Arup Consulting Engineers

The above results indicate that the areas to the north and the south of the town, which are predominantly residential areas, experience a greater parking demand during the early morning period than the lunch time period. However, whilst the central business area experiences a greater demand for parking during the lunch time period, the increase in demand from the morning period is nominal. This is due to the presence of a large number of residential parkers in the centre of the town. Whilst parking is hugely in demand in the centre of the town it is noted from site visits that a large amount of illegal parking occurs on Strand Street particularly outside the convenience store, therefore it is desirable to provide more parking in the vicinity of this area.

### 4.2 New Car Park

At present Cork County Council are in the process of constructing a public car park at the site of the old firehouse, which is located to the east of Main Street and north of Chapel Square. This new car park will accommodate 12 car parking spaces and will also include a roadway connecting Main Street to Railway Street via Steam Packet Quay. This new roadway will allow access to the newly developed apartments and commercial units on Steam Packet Quay. At present a new Credit Union is under construction at the south east corner of Chapel Square this will lead to an increase in commercial activity in this section of the town and thus the provision of extra car parking in the area will be beneficial.

### 4.3 Potential Parking Sites

The potential to provide an off-street car park in Passage West was investigated, however due to the linear nature of the town and the fact that nearly all open space in the vicinity of the main road has either been built on or is designated public green space it was difficult to find suitable sites, nonetheless a small number of potential sites exist.

The first potential site is located on Beach Road immediately to the south of the site of the terraced houses which are currently under construction. At present this site is green field, however if the site was cleared and surfaced then it could potentially accommodate a sizable number of vehicles (40 – 50 vehicles). This site has a number of benefits, firstly it is within a very short walk of the shops/ businesses on Strand Street, secondly as the site is quite large it could easily accommodate the excess parking demand in the town whilst at the same time serving the towns long stay parking demand (or as a casual park and ride site, as the local bus service has bus stops located nearby on Strand Street). The disadvantage associated with this site is the fact that it is in private ownership and thus acquiring this land could be expensive, in addition exiting from Beach Road out onto Back Street suffers from visibility issues.

A second potential site to provide extra parking in the town is the small public park located on Strand Street immediately to the south of the Credit Union. If this site was changed to car parking it would lead to the creation of 6 parking spaces this would be an overall increase of 3 parking spaces on the number that currently parallel park at this area. Crucially this site is located in close proximity to the convenience store which is one of the greatest parking generators within the town. One of the benefits of converting this site into parking is that the site is currently in the ownership of the town council, however its conversion to parking will also draw significant losses in terms of amenity and its conversion to parking is not recommended with the only proposed change to the public park would be to improve pedestrian access through the park.

The primary parking requirement for Passage West is convenient parking close to the town centre, parking outside the town centre will have only marginal benefit to the overall management of parking in Passage West. As the number of available parking areas is very limited it is recommended that Cork County Council pursue the development of a car park on Beach Road. This car park will be capable of providing the additional parking capacity the county council need to enforce the parking regulations within the town.

### 4.4 Future Parking Provision

As the centre of the town develops it will be critical that any major expansion of the retail core of the town is complimented with the extension to the towns parking stock within the core of the town. Therefore, it is recommended that any major development within the centre of the town includes public parking spaces which will also serve the existing business.

## 5. PEDESTRIANS

### 5.1 General

From site visits it is noted that pedestrian facilities within the town are average. Footpaths are provided on at least one side of each of the main streets within the town. However there is only one pedestrian crossing facility in the centre of the town, the zebra crossing located outside the Credit Union on Strand Street. It is noted from site visitations that there is a large reliance on vehicular transport in Passage West, this is particularly true for residents in the residential areas to the west of Church Hill, who due to the steep nature of Church Hill favour vehicular transport to access the town.

### 5.2 Improved Pedestrian Facilities

As part of the updated traffic management system it is recommended that a number of pedestrian improvements are made. Firstly it is recommended that pedestrian access is provided through the public park on Strand Street, this will greatly improve both pedestrian safety and pedestrian connectivity between the retail units on Strand Street and the car park area located outside Haulbowline Industries. The second recommendation to improve pedestrian facilities in the town is to provide dropped kerbs and tactile paving on the northern section of Back Street and Main Street. These provisions will greatly improve pedestrian connectivity between the new car park on the site of the old firehouse and the new credit union building on the corner of Back Street and Chapel Square.

It is recommended that in time and when suitable funding becomes available the existing zebra crossing within the town is replaced with a pelican crossing. The upgrading of the crossing will provide greater security to those crossing the road as they will have dedicated green time to cross.

In addition, following the implementation of the new traffic management measures at Chapel Square the informal pedestrian crossing point will need to be monitored to see if a dedicated pedestrian crossing is required. However, it is noted that due to the short crossing distances a formal pedestrian crossing may not be required.

## 6. JUNCTION ANALYSIS

### 6.1 General

The traffic impact of existing traffic flows and potential future flows has been assessed, the following scenarios have been considered.

- Year 2005 – Baseline condition
- Year 2008 – Baseline condition
- Year 2008 – Following the proposed development of Steampacket Quay, Haulbowline Industries, the completion of the O’Flynn/ O’Brien development and the relocation of the new primary school at Church Hill

A growth factor of 2% per annum was used to establish future traffic volumes for the design year 2008. This growth factor is based on National Road Authority growth rates for non-national roads.

The trip rates used in this assessment have been obtained by using the TRICS database. The TRICS database is a UK database containing trip generation rates for various different land uses, including residential, retail and office.

### 6.2 Potential Future Developments

At present there are a number of proposed developments either currently under construction or in the planning stage in Passage West. The following potential developments have been used to assess the projected future operation of the main junctions within the town.

#### 6.2.1 Steampacket Quay

A development is proposed for Steampacket Quay consisting of 14 apartments and 100m<sup>2</sup> of office space. The traffic expected to be generated by the development can be seen in the tables below.

**Table 6.2.1 Predicted Traffic Flows – Steampacket Quay AM peak**

Land Use	Trip Rate AM Inbound	Vehicles Inbound	Trip Rate AM Outbound	Vehicles Outbound
14 Apartments	0.2 per apartment	3	0.8 per apartment	11
100m <sup>2</sup> of Office Space	1.61 per 100m <sup>2</sup>	2	0.17 per 100m <sup>2</sup>	0
<b>Total</b>		<b>5</b>		<b>11</b>

**Table 6.2.2 Predicted Traffic Flows – Steampacket Quay PM peak**

Land Use	Trip Rate PM Inbound	Vehicles Inbound	Trip Rate PM Outbound	Vehicles Outbound
14 Apartments	0.7 per apartment	10	0.2 per apartment	3
100m <sup>2</sup> of Office Space	0.14 per 100m <sup>2</sup>	0	1.16 per 100m <sup>2</sup>	1
<b>Total</b>		<b>10</b>		<b>4</b>

### 6.2.2 Haulbowline Industries

The site at Haulbowline Industries is zoned in the County Development Plan as a town centre site consisting of mixed retail, commercial, service, civic and residential uses. The proposed development details for this town centre development were obtained from Cork County Council and consisted of the following:

- 264 apartments
- 72 bed hotel
- 947m<sup>2</sup> bar and restaurant
- 2,076m<sup>2</sup> of retail
- 6,049m<sup>2</sup> of office space

The traffic expected to be generated by the development can be seen in the tables below.

**Table 6.2.3 Predicted Traffic Flows – Haulbowline Industries AM peak**

Land Use	Trip Rate	Vehicles	Trip Rate	Vehicles
	AM Inbound	Inbound	AM Outbound	Outbound
264 Apartments	0.2 per apartment	53	0.8 per apartment	211
6,049m <sup>2</sup> of Office Space	1.61 per 100m <sup>2</sup>	97	0.17 per 100m <sup>2</sup>	10
72 bedroom Hotel	0.25 per bedroom	18	0.24 per bedroom	17
947m <sup>2</sup> of Bar/ Restaurant	2.00 per 100m <sup>2</sup>	19	2.67 per 100m <sup>2</sup>	25
2,076m <sup>2</sup> of Retail	1.85 per 100m <sup>2</sup>	38	1.79 per 100m <sup>2</sup>	37
<b>Total</b>		<b>226</b>		<b>301</b>

**Table 6.2.4 Predicted Traffic Flows – Haulbowline Industries PM peak**

Land Use	Trip Rate	Vehicles	Trip Rate	Vehicles
	PM Inbound	Inbound	PM Outbound	Outbound
264 Apartments	0.7 per apartment	185	0.2 per apartment	53
6,049m <sup>2</sup> of Office Space	0.14 per 100m <sup>2</sup>	8	1.16 per 100m <sup>2</sup>	70
72 bedroom Hotel	0.23 per bedroom	17	0.22 per bedroom	16
947m <sup>2</sup> of Bar/ Restaurant	4.04 per 100m <sup>2</sup>	38	2.51 per 100m <sup>2</sup>	24
2,076m <sup>2</sup> of Retail	4.93 per 100m <sup>2</sup>	102	5.07 per 100m <sup>2</sup>	105
<b>Total</b>		<b>350</b>		<b>268</b>

**6.2.3 O'Flynn/ O'Brien Development**

A 600 residential unit development is currently under construction to the north of Passage West Town. The traffic expected to be generated by the development can be seen in the tables below.

**Table 6.2.5 Predicted Traffic Flows – O'Flynn/ O'Brien Development**

Land Use	Trip Rate	Vehicles	Trip Rate	Vehicles
	AM Inbound	Inbound	AM Outbound	Outbound
600 residential units	0.2 per unit	120	0.8 per unit	480
<b>Total</b>		<b>120</b>		<b>480</b>

**Table 6.2.6 Predicted Traffic Flows – O'Flynn/ O'Brien Development**

Land Use	Trip Rate	Vehicles	Trip Rate	Vehicles
	PM Inbound	Inbound	PM Outbound	Outbound
600 residential units	0.7 per unit	420	0.2 per unit	120
<b>Total</b>		<b>420</b>		<b>120</b>

**6.2.4 Passage West Primary School**

It is proposed to relocate Passage West primary school to a site on Church Hill in the future. The new school is expected to accommodate 600 pupils. The traffic expected to be generated by the development can be seen in the table below.

**Table 6.2.7 Predicted Traffic Flows – Primary School AM peak**

Land Use	Trip Rate	Vehicles	Trip Rate	Vehicles
	AM Inbound	Inbound	AM Outbound	Outbound
600 pupil school	0.19 per pupil	114	0.16 per pupil	96
<b>Total</b>		<b>114</b>		<b>96</b>

**Table 6.2.8 Predicted Traffic Flows – Primary School PM peak**

Land Use	Trip Rate	Vehicles	Trip Rate	Vehicles
	PM Inbound	Inbound	PM Outbound	Outbound
600 pupil school	0.01 per pupil	6	0.02 per pupil	12
<b>Total</b>		<b>6</b>		<b>12</b>

**6.2.5 Development Distribution**

The distribution of each development within the town can be seen in the table below.

**Table 6.2.9 Development Distribution**

Street	Steam Packet Quay	Haulbowline Industries	O'Flynn/ O'Brien Development	Primary School
Main Street/ Back Street	70%	70%	20%	30%
Railway Street	100%			
Church Hill	15%	15%	5%	60%
Strand Road (North of Haulbowline Industries)	15%	85%	15%	30%
Strand Road (South of Haulbowline Industries)	15%	15%	15%	30%

**6.2.6 Development Assignment**

The assignment of the development traffic within the town can be seen in the tables below.

**Table 6.2.10 Development Assignment AM Peak**

Street	Steam Packet Quay	Haulbowline Industries	O'Flynn/ O'Brien Development	Primary School
Main Street	3	158	96	34
Back Street	8	211	24	29
Railway Street	16	0	0	0
Church Hill	2	79	30	126
Strand Road (North of Haulbowline Industries)	2	448	90	63
Strand Road (South of Haulbowline Industries)	2	79	90	63

**Table 6.2.11 Development Assignment PM**

Street	Steam Packet Quay	Haulbowline Industries	O'Flynn/ O'Brien Development	Primary School
Main Street	7	245	24	2
Back Street	3	187	84	4
Railway Street	14	0	0	0
Church Hill	2	93	27	11
Strand Road (North of Haulbowline Industries)	2	526	81	5
Strand Road (South of Haulbowline Industries)	2	93	81	5

### 6.2.7 Haulbowline Industries

At present the Haulbowline industries site is currently in operation and generating traffic. Therefore, if the proposed development is constructed then this existing traffic will be removed from the network. The reduction in traffic can be seen in the table below.

**Table 6.2.8 Existing Haulbowline Industries Traffic**

Street	AM Peak	PM Peak
Main Street	10	2
Back Street	6	7
Railway Street	0	0
Church Hill	0	0
Strand Road (North of Haulbowline Industries)	16	9
Strand Road (South of Haulbowline Industries)	4	11

## 6.3 Link Flows

The projected two-way traffic flows are shown for the year 2008 in Table 6.3.1 below.

**Table 6.3.1 Projected Link Flows**

Link		Year 2008 Baseline Condition		Year 2008 After All Proposed Developments Completed	
		AM Peak	PM Peak	AM Peak	PM Peak
1	Main Street	246	396	528 (114%)	672 (70%)
2	Back Street	328	371	594 (81%)	642 (73%)
3	Railway Street	15	21	30 (108%)	35 (67%)
4	Strand Street (South of Junction)	374	625	962 (157%)	1231 (97%)
5	Church Hill	238	272	475 (100%)	404 (49%)
6	Beach Road	23	32	23 (0%)	32 (0%)
7	Strand Street (North of Haulbowline)	385	639	973 (153%)	1244 (95%)
8	Haulbowline Industries	20	11	527	618
9	Strand Street (South of Haulbowline)	327	594	557 (71%)	773 (30%)

Source: Arup Consulting Engineers

From the above table it can be seen that the increase in traffic is expected to range from 50% - 160% on the major streets in Passage West.

## 6.4 Junction Analysis

In urban conditions it is generally recognised that junctions rather than roads linking these junctions are the key determinant of capacity of the local area.

The impact on the surrounding junctions has been assessed utilising the PICADY 4.1 and ARCADY 4 software applications. The software was developed by the Transport Research Laboratory (TRL) in the UK and is used to determine the capacity of priority and roundabout junctions respectively. Details of the junction analysis are outlined in the following subsections.

Due to the unusual layout of the main junction within Passage West it is not possible to analysis the junction in its current configuration therefore the junction has been modelled as two separate, east and west, three-arm priority junctions

### 6.4.1 Main Junction East

This section of the junction has been analysed as a three-arm priority junction with traffic from Main Street and Railway Street assigned to the minor arm and Strand Street – Back Street forming the major arm. All arms on the approach to this junction are single lane. The operational assessment results for the proposed junction are shown in Table 6.4.1

**Table 6.4.1 Predicted Traffic Impact for Main Junction East – Current Layout**

Scenario	Capacity	
	AM Peak	PM Peak
Year 2005 (Baseline Condition)	47%	76%
Year 2008 (Baseline Condition)	50%	81%
Year 2008 (After Construction of Proposed Developments)	109%	134%

Source: Arup Consulting Engineers

The above analysis indicates that the junction in its current layout operates within capacity, it is expected that this will remain the case in the future provided there is no development in the area. However when all development is constructed in the area then it is expected that the junction will exceed its capacity in both the morning and evening peak period. The projected queuing will primarily form along Main Street.

It should be noted that as traffic flows increase on the main streets within the town the impact on-street parking has on the generation of traffic queues will be significantly increased.

### 6.4.2 Main Junction West

This section of the junction has been analysed as a three-arm priority junction with traffic from Church Hill and Beach Road assigned to the minor arm and Strand Street – Back Street forming the major arm. All arms on the approach to this junction are single lane. The operational assessment results for the proposed junction are shown in Table 6.3.2

**Table 6.42 Predicted Traffic Impact for Main Junction West – Current Layout**

Scenario	Capacity	
	AM Peak	PM Peak
Year 2005 (Baseline Condition)	33%	28%
Year 2008 (Baseline Condition)	35%	30%
Year 2008 (After Construction of Proposed Developments)	67%	55%

Source: Arup Consulting Engineers

The above junction analysis indicates that the junction operates well within capacity in its current layout; this is expected to remain the case in the future.

### 6.4.3 Haulbowline Industries Junction

At present this junction is a three-arm priority junction with single approach lanes on all arms. It is also noted from site visits that visibility at this junction is good. The results of the analysis of the junction can be seen in Table 6.3.3

**Table 6.43 Predicted Traffic Impact – Haulbowline Industries Priority Junction**

Scenario	Capacity	
	AM Peak	PM Peak
Year 2005 (Baseline Condition)	2%	2%
Year 2008 (Baseline Condition)	2%	2%

Source: Arup Consulting Engineers

From the above analysis it can be seen that the Haulbowline Industries junction currently operates well within capacity and that this will remain the case in the future without the development of the area.

If the proposed development is constructed on the site currently occupied by Haulbowline Industries then it is also proposed to construct a new entrance to the south of the current entrance, which will then become redundant. The new junction will consist of a roundabout with single entry arms. The results of the analysis of the proposed roundabout junction can be seen in the table below.

**Table 6.44 Predicted Traffic Impact – Haulbowline Industries Roundabout Junction**

Scenario	Capacity	
	AM Peak	PM Peak
Year 2008 (After Construction of Proposed Developments)	52%	73%

Source: Arup Consulting Engineers

The above junction analysis indicates that the proposed roundabout is expected to have sufficient capacity to accommodate the projected increase in traffic due to the construction of proposed developments. However the construction of any new junction within Passage West should include pedestrian safety in its design, which may require modification to the resultant proposal.

#### 6.4.4 Main Street – Strand Street Four Arm Priority Junction

A possible option to improve traffic management in Passage West is the creation of a four arm priority junction at the intersection of Main Street – Strand Street. An operational assessment of this junction layout has been undertaken and the results can be seen below.

**Table 6.45 Predicted Traffic Impact for Four Arm Priority Junction**

Scenario	Capacity	
	AM Peak	PM Peak
Year 2005 (Baseline Condition)	33%	27%
Year 2008 (Baseline Condition)	35%	29%
Year 2008 (After Construction of Proposed Developments)	74%	68%

Source: Arup Consulting Engineers

The above analysis indicates that the proposed junction is expected to operate well within capacity both at present and in the future even if potential developments are constructed. However, as stated previously the presence of on-street parking within the core of the town will continue to result in the generation of some traffic queues.

#### 6.4.5 Main Street – Strand Street Roundabout

Another potential junction option for the Main Street – Strand Street intersection is the creation of a roundabout around the existing building located between Main Street and Back Street at the southern end. The operational analysis of this junction can be seen below.

**Table 6.46 Predicted Traffic Impact for Roundabout**

Scenario	Capacity	
	AM Peak	PM Peak
Year 2005 (Baseline Condition)	37%	59%
Year 2008 (Baseline Condition)	39%	63%
Year 2008 (After Construction of Proposed Developments)	87%	111%

Source: Arup Consulting Engineers

The above analysis indicated that the proposed roundabout junction is expected to operate within capacity at present and in the future baseline condition. However it is noted that if the town centre is expanded then the roundabout solution is expected to operate at capacity in the evening peak period.

## 6.5 Future Strategic Improvements

As noted from the future projected operation of the junctions, the existing junction arrangement is expected to reach capacity following the expansion of the town centre. However, some of this impact could be reduced by providing additional traffic management measures to include either or both of the following:

- A new road connecting the residential areas to the west of the town with the Rochestown Road to the north of the town. The construction of this link road would assist in removing some of the through traffic along Strand Street and would provide direct access to the existing secondary school and the proposed new primary school without having to pass through the centre of the town. Figure 3 shows an indicative location for the link road.
- The demolition of the buildings between Main Street and Back Street and the realignment of Main Street to form a standard two lane roadway. The removal of the buildings within the centre of Passage West will improve junction capacity through the town and the provision for additional on-street parking spaces will reduce the chances of traffic being delayed due to unauthorised parking.