

Royal College Street Road Safety and Traffic Feasibility Study

Transport Strategy Design Team



Royal College Street Feasibility Report

Royal College Street – Road Safety and Traffic Feasibility Study

June 2011

Environment and Transport
Culture and Environment
London Borough of Camden
4th Floor Town Hall Extension
Argyle Street
London WC1H 8EQ
Tel: 020 7974 8710
Fax: 020 7974 8867
www.camden.gov.uk

Prepared by:

Brian Deegan

.....

Approved by:

Simi Shah

.....

Status: Draft

Issue No. 1

Date: 1.6.11

Contents

Executive Summary

1. Background	5
1.1 Design Objectives	5
1.2 Existing Site Details	7
1.3 Existing Parking Conditions	16
1.4 Other Site Constraints.....	17
2. Collision Data and Analysis	18
2.1 Collision Data	18
2.2 Analysis of Collisions	18
3. Traffic Data and Analysis	29
3.1 Traffic Survey	29
3.2 Traffic Data and Analysis	30
4. Site Observations	37
5. Statistical Tests	37
6. Summary of Safety Problems	37
7. Options for Treatment.....	38
7.1 Option A.....	39
7.2 Option B.....	39
8. Estimated Accident Savings	40
8.1 Option A.....	40
8.2 Option B.....	40
8.2 Option C.....	40
9. Estimated cost of scheme.....	42
9.1 Option A.....	43
9.2 Option B.....	43
8.2 Option C.....	40
10. First Year Rate of Return.....	44
11. Recommended Scheme	45

Executive Summary

The Transport Strategy Design Team has been commissioned by the Public Realm and Planning Team to undertake a feasibility study of Royal College Street. The London Borough of Camden is currently undertaking several projects to improve the public realm, accessibility, road safety and traffic management in the Camden Town area. In particular Royal College Street falls within the Camden Town East project, which covers an area bounded by Crowndale Road, Royal College Street, Camden Road and Camden High Street. Due to the range of traffic management and road safety issues on Royal College Street, a separate study has been commissioned to look at these issues in more detail.

In order to inform the design options presented in this feasibility study a detailed collision analysis was undertaken as well as a review of wider traffic management issues. The needs of all road users have been assessed and the options are presented in line with the local implementation plan objectives.

The recommended option is shown in section 7 as option A and involves removing the two-way cycle track and providing a segregated contraflow lane for southbound cyclists and a wide mandatory cycle lane for northbound cyclists. The collisions associated with cycle tracks at side road junctions have been designed out whilst maintaining a route that is ideal for cycling and pedestrians. The strategic nature of the road in terms of local distribution has also been maintained. Two other options have also been provided for reference, the first return the road to two-way working for all users. The final option looks to maintain the existing condition whilst mitigating the collision locations through the reprioritisation of side road junctions.

The cost estimate for the delivery of the recommended option is £52,875

1. Background

1.1 Design Objectives

On the 14th April 2011 a scheme brief was issued by the Public Realm and Planning Team to examine Royal College Street and deliver design options within the scope specified below:

- The potential to open all or part of Royal College Street to two way working, assessing the likely impact on adjacent roads and the risk of vehicles rat running.
- The possibility of banning turning movements to improve safety.
- The possibility of providing a cycle lane (southbound) along the entirety of Royal College Street, improving cycling permeability. The implementation of an additional cycle route north of Georgiana Street will improve cycle permeability from Camden Road Overground Railway Station south towards Kings Cross and the West End.
- Feasibility of running a new bus route along Pratt Street, including opening the whole of Pratt Street to two way traffic movement and the risk and impacts of vehicles rat running between Camden Road and Camden Street.
- Reviewing the impacts and benefits of changing the segregated cycle way, encompassing three possibilities including:
 - The complete removal of the segregated cycle lane;
 - Reducing the segregated cycle lane to one way, northbound matching the direction of vehicle movement; or
 - Changing the segregated cycleway to one way northbound and add an additional southbound cycle lane on the eastern side of Royal College Street, this should be combined with the potential to incorporate a two way road along Royal College Street.

Where possible the following design elements should be introduced:

- Options for traffic calming such as carriageway narrowing, alternative parking layouts, vertical traffic calming, signing and lining.

Royal College Street Feasibility Report

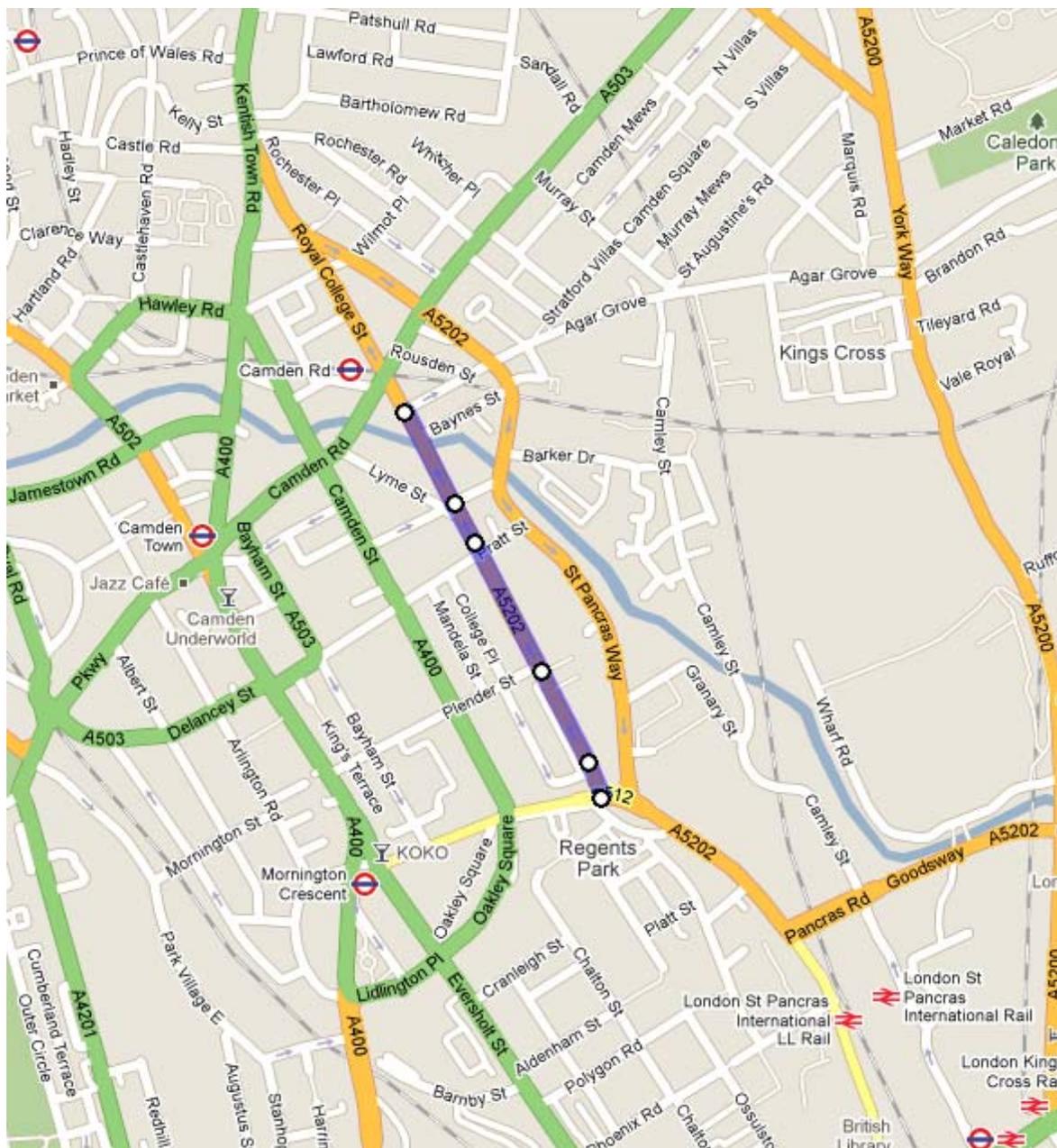
- Alternative junction layouts i.e. changing junction priority or mini roundabouts.
- The installation of cycle hire located in the close proximity of Pratt Street.
- Reduce visibility from the side streets (Pratt Street and Plender Street), to discourage vehicles from edging out into the cycle lane prior to looking both ways and reduce vehicle speeds on the approach to Royal College Street.
- Street trees, bicycle parking and de-cluttering,

The impact of these specifications will be assessed throughout this report and will inform the design options presented in section 7.

1.2 Existing site details

Royal College Street is located to the east of Camden Town centre and provides a link between the Kings Cross/St Pancras Area and Kentish Town Road and Camden Road. Royal College Street runs parallel to the Regent's Canal and is residential in nature at its middle and southern parts but is more commercial at its northern end. Most of the residential properties are privately owned and most of the commercial premises to the north of Royal College Street are small locally managed shops.

Location Map:



Royal College Street Feasibility Report

Royal College Street is a one way street with two running lanes for the majority of its length. Parking is restricted to the eastern side of the carriageway in order to facilitate the two-way cycle track on the western side of the carriageway. It should be noted that if a wide vehicle is heading down Royal College Street then it effectively becomes one lane. Also as the road is relatively lightly trafficked vehicles tend to travel in one lane in the southern section.



Standard layout of Royal College Street for the majority of its length. Wide footway, two way cycle track, two running lanes and parking bays. Looking north from cycle hire location at southern end.

Royal College Street has speed calming measures including speed cushions at its southern end and raised zebras in the middle and northern sections. Despite the introduction of speed calming measures the 85%ile is still close to 30mph. Roads which have two lanes in one direction are often associated with higher speeds as there is no interaction with oncoming traffic. This could be offsetting the calming effect of the tables and cushions. Royal College Street carries less than 10,000 vehicles a day and so due to the available carriageway space has no capacity issues. It could be being used as a clear non-busy cut through route that avoids the activity and congestion of Camden High Street for northbound vehicles. A clear straight wide road would

Royal College Street Feasibility Report

inevitably be associated with high speeds despite the introduction of calming measures. The calming measures in place are also shallow so as not to adversely affect buses and their passengers. Royal College Street is used by the number 46 bus which travels between Lancaster Gate and Farringdon via Swiss Cottage, Hampstead and Kings Cross. Raised tables are provided inside the cycle tracks in order to allow pedestrians to access the bus service. The number 46 is a single decked bus with front and mid point doors.



Royal College Street southern end bus stop looking north.

The photo above shows the raised table that connects the bus stop to the access and exit point of the bus. Buses have to line themselves up accurately with the table in order to avoid what could be a trip hazard caused by the raised kerb segregated cycle track. Although no formal complaints have been made during peak periods the table represents a point of potential conflict between pedestrians and cyclists. Fast moving commuter cyclists in the morning are at particular risk of clashing with exiting bus users. The table is marked as a give way point and so pedestrians have priority but it is often difficult for cyclists to lose momentum by coming to a stop especially on a facility that is design to keep their movement continuous. Warning plates informing cyclists to beware of crossing pedestrians have been provided to

Royal College Street Feasibility Report

mitigate against any potential clash but these are not illuminated and at the bus stop shortly before Plender Street this sign has been twisted and is partially obscured by foliage. One further issue with the bus stop occurs at the southern end of the route where buses dropping off can narrow the carriageway to such an extent that vehicles find it difficult to pass especially if a large vehicle is parked opposite. This could result in traffic queuing back to the Crowndale Road junction.



A large vehicle effectively taking up two lanes on Royal College Street looking north from Plender Street.

There is one side road on the western side of the carriageway along Royal College Street, Plender Street. On the eastern side of the carriageway there are two side roads Baynes Street and Randolph Street. There are also two cross road junctions at Pratt Street and Georgiana Street. Most of the collisions that occur are centred on the junctions of Pratt Street and Plender Street and so the existing conditions of each one is presented below. The junction with Camden Road at the north end of the route is outside of the scope of this study and is currently under the control of Transport for London as Camden Road forms part of the Transport for London Road Network.



Royal College Street looking north across Plender Street

Plender Street runs between Camden High Street and Royal College Street. Due to the one-way nature of Royal College Street there is a compulsory left turn for vehicles approaching from Plender Street. The junction has a side road entry treatment which has been extended across the two-way cycle track. Red antiskid surfacing has been used on the junction approach as well as flashing warning lights and a warning plate. Green antiskid surfacing has been used on the cycle track but this is wearing thin at the junction. A zebra crossing is in place to the south of the junction. York Paving slabs are present as well as several service covers and blister style tactile paving. Sightlines are good looking south on the junction approach but the building line and a BT phone box block sightlines north. This sight line discrepancy could account for some of the collisions as drivers can see a long way down Royal College Street and anticipate traffic but may not be aware that the stop line is there to stop collisions with southbound cyclists in the cycle track. Pavements are wide on the western side of the carriageway at this point but much narrower on the eastern side.

Royal College Street Feasibility Report



View from the zebra crossing near Plender Street looking south. Oncoming vehicles are obscured by parked traffic. Likewise vehicles will not see pedestrians stepping out until they reach the junction.



Raised zebra crossing to the south of the junction with Pratt Street looking north.

Royal College Street Feasibility Report

Vehicles still approach at speed but as the gradient of the table has been reduced the noise of impact has lessened. A sinusoidal profile could help reduce noise further whilst reducing the noise from impact. Ideally other measures could be introduced to further reduce speeds.



Pratt Street junction with Royal College Street looking east at the junction treatment.

Sightlines are better than Plender Street and the stop sign is located at the junction mouth. A side road entry treatment is in place that has been extended out across the cycle track to make a table. Pratt Street runs between Camden High Street and St Pancras Way but is one way westbound past Camden Street. Red antiskid surface treatments are present as an accident remedial measure and the cycle track has green antiskid surfacing. The green surfacing has faded to grey and is almost indiscernible from the carriageway. The Pratt Street junction with Royal College Street has undergone junction radii tightening on the western side of the carriageway but has been left at full width on the eastern side. Further modification may be necessary to accommodate bus movements.



Looking north from Royal College Street to the junction with Georgiana Street where the cycle track ends and feeds into an ASL.

Southbound cyclists heading from the cycle track on St Pancras Way are routed across the junction and round into the track. This arrangement is not intuitive but is safe and is controlled by the signalisation at the junction. Georgiana Street is one way onto Royal College Street from the East and West meaning any traffic heading from Georgiana Street will end up heading northbound up Royal College Street towards the Camden Road junction. There are M shaped cycle stands at this junction and a wide footway area. Cyclists are exempt from the compulsory left turn for Georgiana Street heading west from St Pancras Way. Cyclists heading northbound here either turn right to head round to St Pancras Way and the route towards Islington, go straight ahead to join Camden Road or head towards Kentish Town down the northern section of Royal College Street or can turn left and head towards Camden Town. This junction therefore represents an important interchange for cyclists for journeys heading in several directions.

Royal College Street Feasibility Report



The junction of Baynes Street is located slightly to the north of the zebra crossing which sits on top of a bridge over the Regent's Canal. Baynes Street is one way westbound with Randolph Street which runs parallel to the north providing one-way access southbound. Baynes Street runs between St Pancras Way and Royal College Street and is used by buses and vehicles turning under the railway bridge at its eastern end. Dropped kerbs with buff blister tactile paving is provided. This represents the northern extent of the study area as stipulated in the brief.

1.3 Existing Parking Condition

With the exception of junctions and crossings parking bays are provided along the entirety of Royal College Street. In the southern section pay and display metres are provided on the eastern side of the carriageway which are operational from 8.30 am to 6.30 pm. Outside the veterinary clinic and across the access points single yellow lines are in place. No parking is permitted alongside the cycle track and this is enforced with a single yellow line.

North of Plender Street there is short stretch of residential parking bays followed by a solo motorcycle parking bay and then more residential bays up to Pratt Street. These residential bays are in operation from 8.30 am until 4.30pm. At the Parcelforce entrance and across the garage forecourt single yellow lines keep the carriageway clear before the zig zag markings near the zebra crossing.

From Pratt Street to Georgiana Street no parking is permitted and this is enforced through single yellow lines. Past Georgiana Street the parking bays move to the western side of the carriageway with a single yellow line in place on the eastern side of the carriageway. The parking bays are for resident permit holders only but from on-site observation both sides of the carriageway were parked on with commercial vehicles.

Beyond the zig zag markings at the zebra crossing near Baynes Street metered bays were in place on the western side of the carriageway. These were hooded and suspended on the day of the site visit and so further clarification will be sought before drawings are circulated. The red route starts to the north of Randolph Street where short term loading bays are provided on the western side of the carriageway.

Any design produced with this report will seek to retain established parking spaces or provide nearby alternatives.

1.4 Other site Constraints

North of Randolph Street, Royal College Street is managed by Transport for London and forms part of the red route network (TLRN). Any works planned along Royal College Street need to take into account any potential impact on the TLRN. Also signal operation adjustments will have to be modelled by TfL engineers and assessed by TfL's Network Assurance Team.

The bridge structure across the canal near Baynes Street needs to be protected and so no vertical or horizontal speed calming can be introduced as the vibrations could affect the structure or vehicles could veer into the structure. Care should be taken with any highway layout adjustments here.

Mature trees are present on the western footway at the southern end of Royal College Street and these should be protected.

Spaces for electric vehicles charge points and cycle hire stations should be accommodated within any design. Areas with natural surveillance in particular should be maintained.

2. Collision Data and Analysis

2.1 Collision Data

Location: Royal College Street

Road accidents between Camden Road and Crowndale Road

Table 1 Summary of accidents

Year	
2008	4
2009	6
2010	7
Total	17

Month	
Jan	1
Feb	1
Mar	2
Apr	3
May	
Jun	
Jul	2
Aug	3
Sep	
Oct	1
Nov	3
Dec	1
Total	17

Day	
Mon	2
Tue	3
Wed	3
Thu	3
Fri	
Sat	1
Sun	5
Total	17

Hour Starting	
00:00	
01:00	
02:00	
03:00	
04:00	
05:00	
06:00	
07:00	
08:00	2
09:00	1
10:00	2
11:00	3
12:00	
13:00	2
14:00	
15:00	
16:00	1
17:00	
18:00	2
19:00	
20:00	3
21:00	1
22:00	
23:00	
Total	

Severity	
Fatal	0
Serious	2
Slight	15
Total	17

Light conditions	
Dark	5
Light	12

Road Surface	
Wet	1
Dry	16
Ice/snow	

Road User	
Ped	3
Car	15
Cyclist	12
Taxi	1
Truck	1

Contributory Factors	
Behaviour	3
Driver/rider error	10
Pedestrian only	2
Injudicious action	2

Manoeuvre	
Overtaking	2
Going ahead	18
Turning right	5
Moving off	1
Reversing	1
Turning left	4

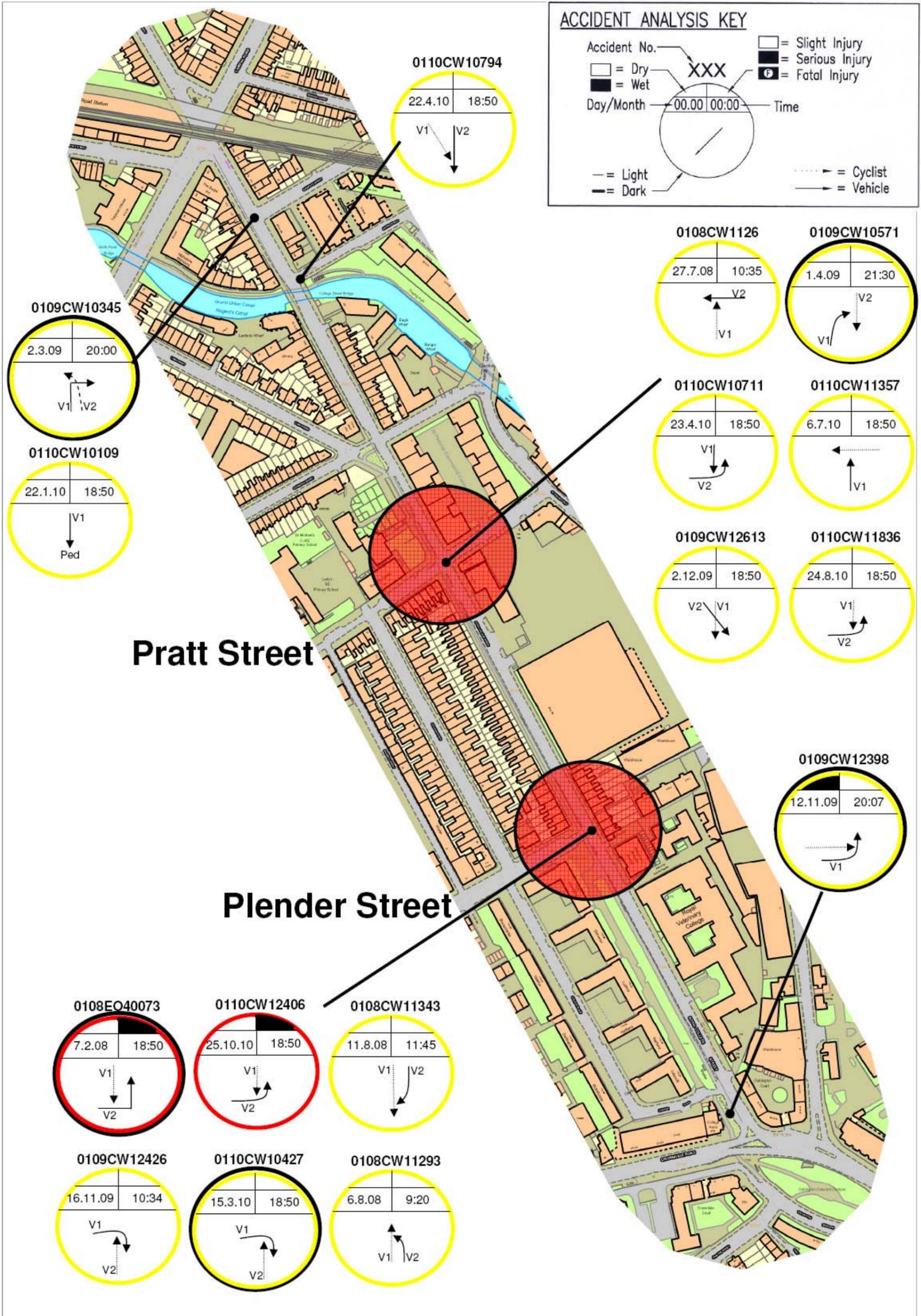
2.2 Analysis of Collisions

From the accident summary table above we can see that accidents are distributed evenly across the last three years and they are higher than would

normally be associated with a road of this type. This would suggest that there is a persistent issue. Accidents are also distributed evenly across the year and so they do not seem to be seasonally related. A large proportion of accidents happen on a Sunday and in the case of cyclists this could suggest that less experienced leisure cyclists are more vulnerable along this stretch. Experienced commuter type cyclists who use the route everyday could well be mitigating for any risk. Higher motor vehicle speeds are normally present on Sundays and so inappropriate use of speed could also be a factor. Accidents are more common in the morning than the evening. For commuter cyclists this could suggest that the southbound journey carries more risk than the northbound journey. This could be due to a number of factors including the downhill gradient southbound and the nature of the two-way cycle track which puts southbound cyclists on a side of the carriageway that drivers would not intuitively expect them to be.

There was only one accident in wet conditions and so this implies that surface condition and maintenance may not be an influence on accident propensity. The cycle track in particular has green antiskid surfacing which provides a high friction surface for cyclists even in wet weather. There are four times as many cyclist accidents as pedestrians and this could suggest that there is a problem with cyclist provision or this could be related to the relatively high number of cyclists who use the route compared to pedestrians. When looking at the contributory factors involved in the accidents the majority involve driver or rider error this could suggest that the road layout is unintuitive to some road users. A more formally controlled or straightforward highway layout may mitigate this. Looking at the types of manoeuvres involved in the accidents a large proportion occur as motor vehicles cut across the cycle track. This suggests that sightlines could be a factor. Vehicles approaching from side roads will see other vehicles in the middle of the carriageway before they see those on the nearside. This is a recognised issue with cycle tracks and despite the high level of conspicuity given to the cycle track across the side road junctions this issue remains.

Collision Location Map



Royal College Street Feasibility Report

Over the last three years there has been two serious collisions, both occurred at the junction of Plender Street and Royal College Street and both involved collisions between motor vehicles turning left and cyclists heading straight ahead. The first of these collisions happened in February 2008 and involved a motor vehicle failing to give way at the stop line on Plender Street at the junction of Royal College Street. The stop line is in place to give priority to the two-way cycle track along Royal College Street. When the motor vehicle over ran the stop line it caused a northbound heading cyclist to brake suddenly, skid and become injured. There was no impact in this collision and so the injuries were related to the loss of control associated with the sudden braking of the cyclist. This junction has had an accident mitigation scheme undertaken in the past to address the likelihood of collisions of this type occurring. The surface of Plender Street has been covered with red anti-skid on the approach with flashing warning lights, a stop sign and two-way cycle crossing warning sign. This incident occurred despite these measures to highlight the priority of cyclists and make motor vehicles stop and wait for a clear crossing interval. In order to further address the likelihood of collisions of this type occurring stronger measures such as part closures and banned movements may be required if the existing layout is to be retained. It should be noted that collisions of this type are commonly associated with two-way cycle tracks. The effects of cycle tracks in greatly increasing cycling flows need to be weighed against the higher than usual risk of promoting cyclists to adopt a crossing position close to the junction mouth.

The second serious collision occurred in a similar way to the first incident except this time the cyclist was heading southbound. Higher speeds are possible southbound due to the carriageway gradient and so it is possible that the cyclist was moving at speed when they failed to see the turning motor vehicle. It should also be noted that when cyclists head southbound using the two-way cycle track they are in an unexpected road position as cyclists tend to adopt a position on the nearside of the carriageway in the direction of travel. This can cause confusion and it should be noted that there are several references in the collision summaries to panic and uncertainty and a failure to judge speed.

Royal College Street Feasibility Report

An accident investigation of the junction of Royal College Street with Plender Street and also the junction with Pratt Street was undertaken in June 2005 and reviewed collisions over the previous two years. During this period there were 11 slight collisions and one serious collision. 10 of these collisions occurred at Pratt Street with only two occurring at Plender Street. The serious collision occurred at Plender Street however. In order to mitigate these collisions as a direct result of this collision assessment, red surfacing was introduced alongside cycle crossing warning plates and flashing warning lights. This mitigation appears to have reduced the number of collisions on the junction with Pratt Street but had little impact on the number of collisions on the junction with Plender Street. On first inspection both these junction layouts look similar and have had the same treatment and so should be behaving in a similar way but when looked at in detail, particularly in terms of road topography and function it is possible to see small differences that are having a large effect.

Photo Study of the junction of Royal College Street with Plender Street and Platt Street from 2005 to present

The following photos attempt to show the history of design changes to these junctions and highlight the small changes that have occurred and are possibly having an impact on the number and frequency of collisions. By understanding the impact of junction modifications it is hoped that a definitive solution can be found in this report.



Pratt Street in March 2005. A side road entry treatment regulates vehicle speeds on the approach but the gradient of the table obscures the stop line position.



Pratt Street in February 2007 during the construction of a raised table to improve the visibility of the cycle track to vehicles approaching from Pratt Street and to make the stop line more visible to encourage compliance.

Royal College Street Feasibility Report



Pratt Street in August 2007 following the introduction of red surfacing, a flashing sign and two warning plates. The same treatment was adopted on Plender Street a year later.



Pratt Street in May 2011; the red surface treatment is still visible but the green antiskid coating on the cycle track has faded to grey. The position of the stop line is still clear.



Plender Street in July 2007 with side road entry treatment obscuring the stop line and two way cycle track. Note that the warning signs on the approach were installed at the same time as the Pratt Street signs.



Plender Street in April 2008. The junction has been raised across the extent of the two way cycle track. Red surfacing has been applied on the approach from Plender Street and Green Surfacing across the junction mouth in the cycle track.



Plender Street in May 2011 the green surfacing has faded on the cycle track.



On the approach to the junction from Plender Street the position of the stop line is obscured and the red surfacing has faded to a much greater extent that Pratt Street. The small difference in the angle of the raised table has effectively hidden the stop line.

Royal College Street Feasibility Report

Maintenance of the surface condition could well be playing a part in the number of collisions occurring at these two junctions as well as minute design discrepancies. There are other factors however that need to be taken into consideration. Plender Street is used as a cut through for motor vehicles heading along Camden High Street who want to bypass Camden Town Centre to head east over to Holloway Road. Pratt Street routes traffic heading southbound down Camden Road back up towards the centre of Camden and so serves a much less attractive purpose as a *cut through*. The deterioration of the road surface is testament to the fact that Plender Street is carrying a lot more traffic than Pratt Street. With the frequency of vehicles turning left onto Royal College Street from Plender Street it may not be appropriate to give cyclists on Royal College Street priority without greater well maintained conspicuity. Responding to the function of this junction whilst making it safe for all users is a key output of this feasibility report. Further to this discrepancy in road function type there is another important determinant in the safety record discrepancies of the two junctions and that is the sight lines. The two photos below show the difference in visibility for cyclists approaching both junctions heading southbound.



Heading southbound towards the junction with Pratt Street. Cyclists can see back over 20m at approaching motor vehicles and likewise vehicles approaching the junction from the west have an equally clear view.



Heading southbound towards Plender Street cyclists can only see 5m back and so cannot anticipate interaction with crossing vehicles. There is no interval where negotiation can take place. Likewise approaching vehicles from the west cannot see cyclists approaching until they are almost at the junction.

The visibility splay on the approach to the Pratt Street junction is wider and so allows cyclists to respond to approaching/encroaching vehicles in a quicker time. This also allows vehicles approaching from the west greater time to respond. In conclusion both junctions have a similar number of collisions but the collisions on Plender Street are of a more serious nature and key determinants could be the volume, strategic road function, maintenance standard and topographical features. These will be assessed and mitigated for in the feasibility designs issued with this report.

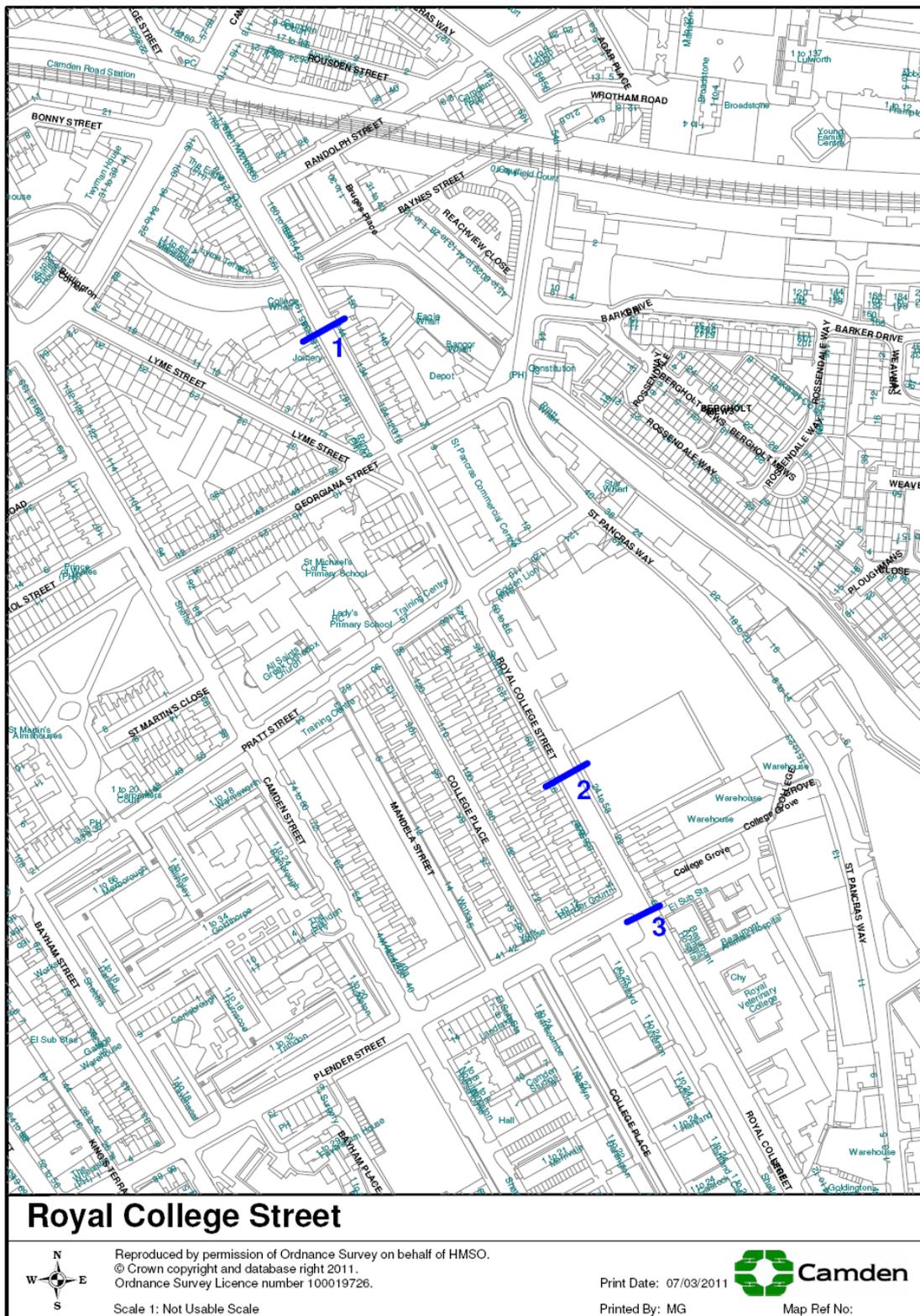
Collision Rate Calculation:

From Camden Road to Crowndale Road Royal College Street is 0.725km long, has an average of 5.6 collisions a year and carries approximately 10,000 vehicles a day. This gives Royal College Street a collision rate of 214 colls/100mvehkms. The average collision rate for an urban A class road is 77 colls/100mvehkms so Royal College Street has a collision rate 2.8 times higher than expected.

3. Traffic Data and Analysis

3.1 Traffic Survey

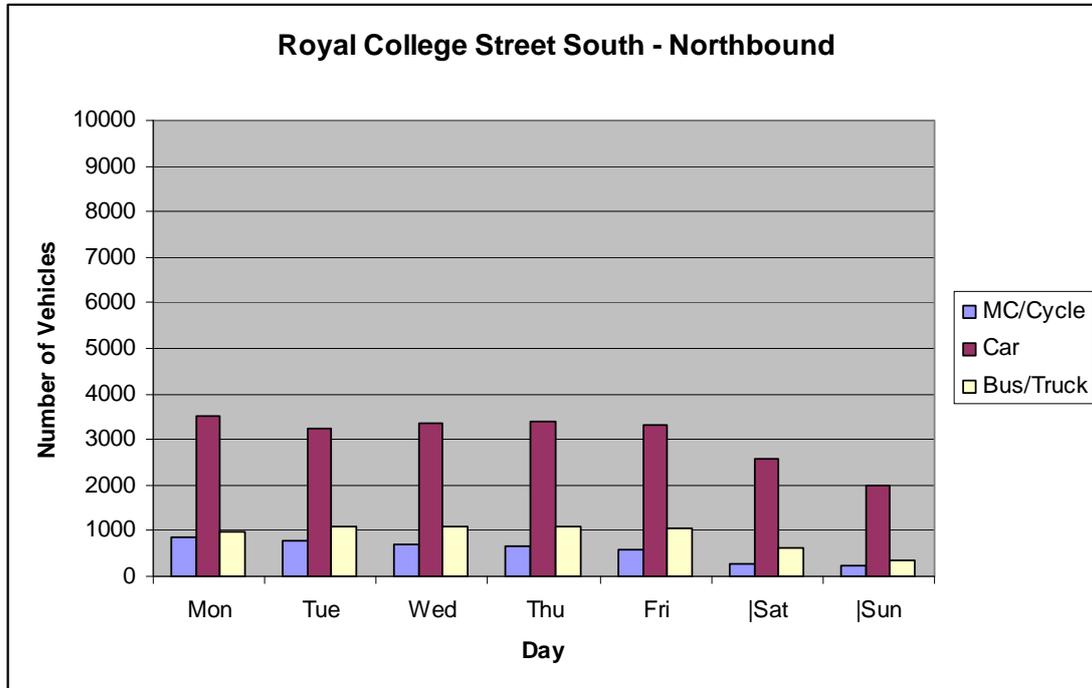
Traffic Surveys were undertaken from 15th March until 21st March 2011 at three points along Royal College Street as shown in the map below. They are referred to as North, middle and south Royal College Street from this point onwards and match the locations of surveys undertaken in May 2008.



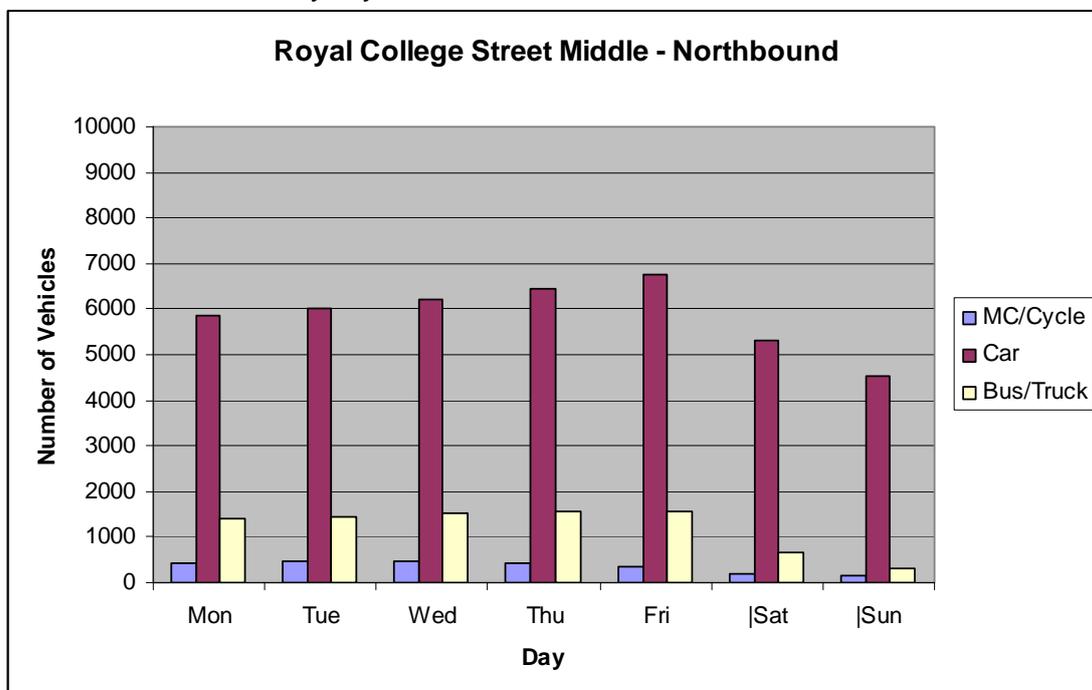
Royal College Street Feasibility Report

3.2 Traffic Data and Analysis

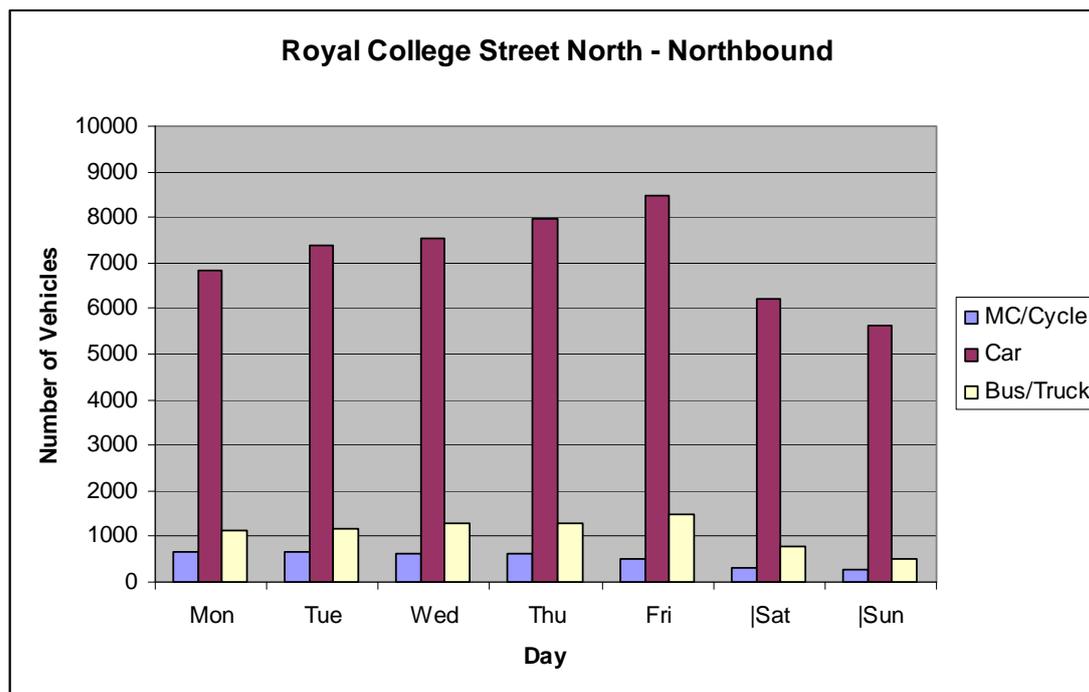
The graphs below show the volume and composition of traffic at the southern, middle and northern sections of Royal College Street. Each table is based on the same scale so the growth of traffic heading northbound can be referenced.



Midweek an average of 5,100 vehicles enter Royal College Street from Crowndale Road everyday.

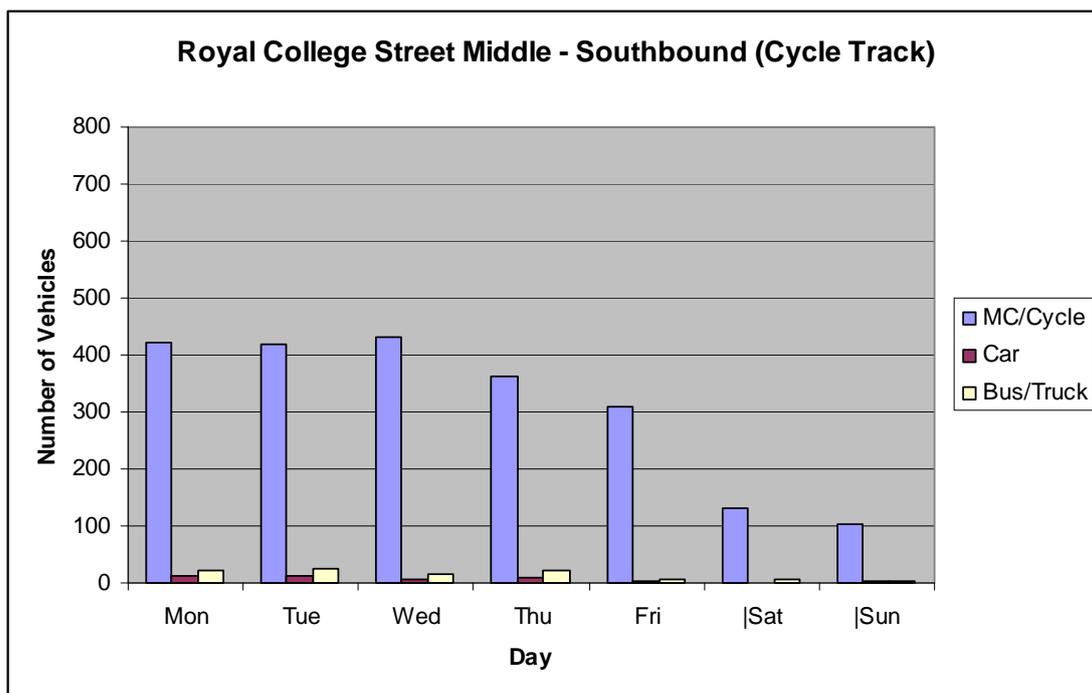
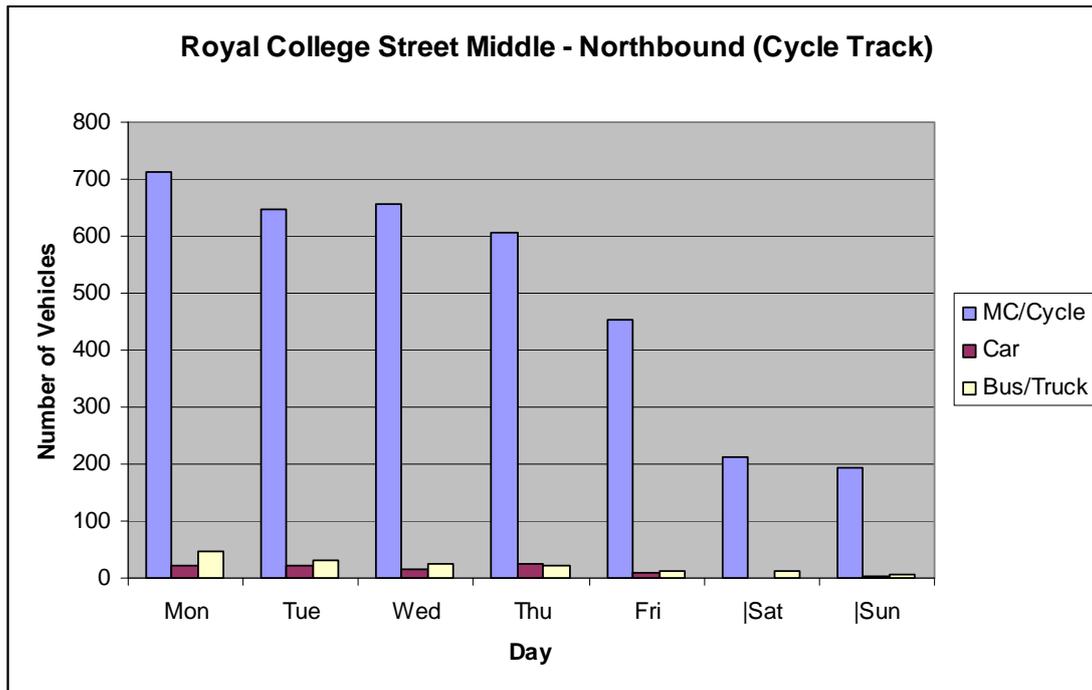


An average of 3,000 vehicles join Royal College Street past Plender Street everyday suggesting that Plender Street is a key feeder route for traffic.



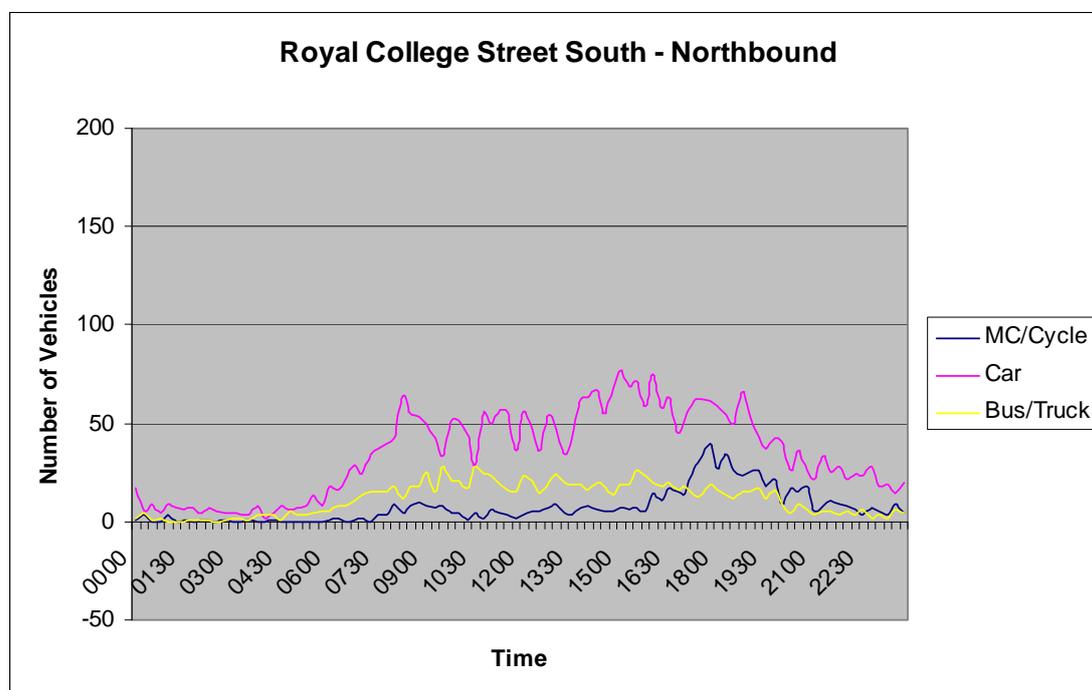
An average of 1,300 vehicles join Royal College Street from Pratt Street and Georgiana Street and suggesting that these routes do not feed as much traffic onto Royal College Street at Plender Street. It should be noted that some traffic will have left Royal College Street at Plender Street, Pratt Street and Georgiana Street but most traffic is heading up to the junction with Camden Road from observation. These flows therefore give a good approximation of the strategic importance of the side roads onto Royal College Street. An average of less than 10,000 vehicles a day is fairly low for Central London and given that two lanes are provided northbound for the majority of Royal College Street capacity is not a concern. In fact the small volume to space ratio may be a determining factor in the relatively high speeds associated with this road.

A further survey was undertaken on the Royal College Street two-way cycle track. Due to the kerb segregation a separate screenline was installed for the track. The screenline system of collecting classified traffic counts is prone to errors in particular when measuring cyclists. Figures in the following tables relating to cars, buses and trucks should be discounted as system errors. The two-way track is designed for the sole use of cyclists and despite occasional parking infringements no vehicles other than cyclists have been observed in the track.

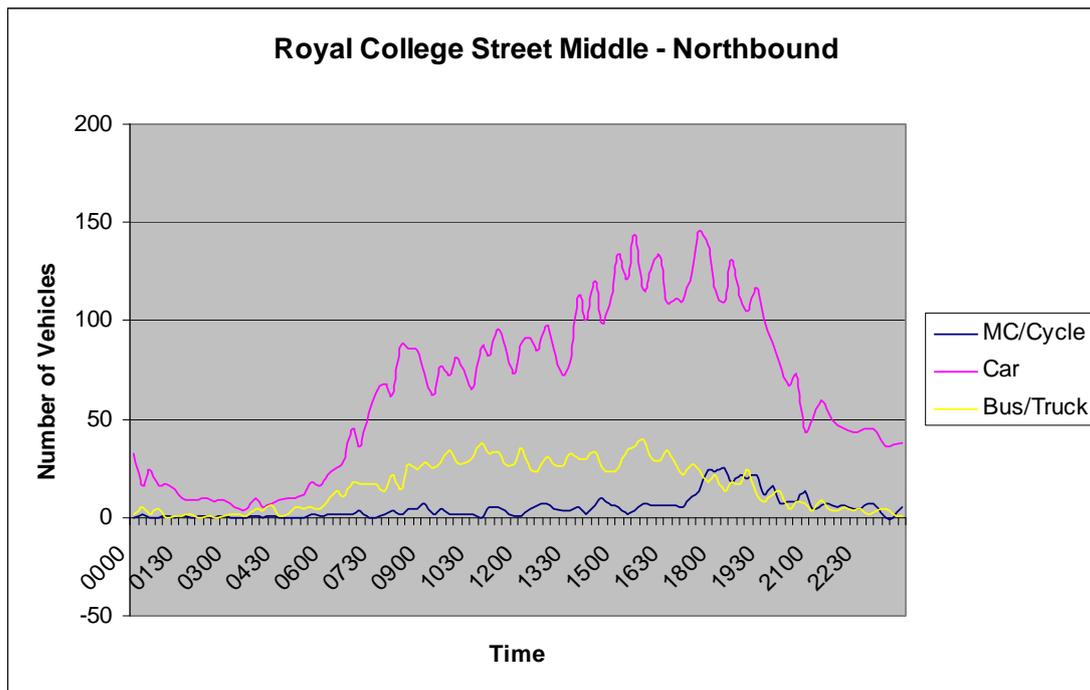


From the tables above we can see that the cycle track carriers almost double the amount of cyclists northbound as it does southbound. Southbound is a slight downhill gradient and so comfort is not the determining factor in this discrepancy. A standard commuter distribution would show roughly equal measures northbound and southbound. These figures suggest that cyclists are taking a different route southbound that is perhaps more direct and

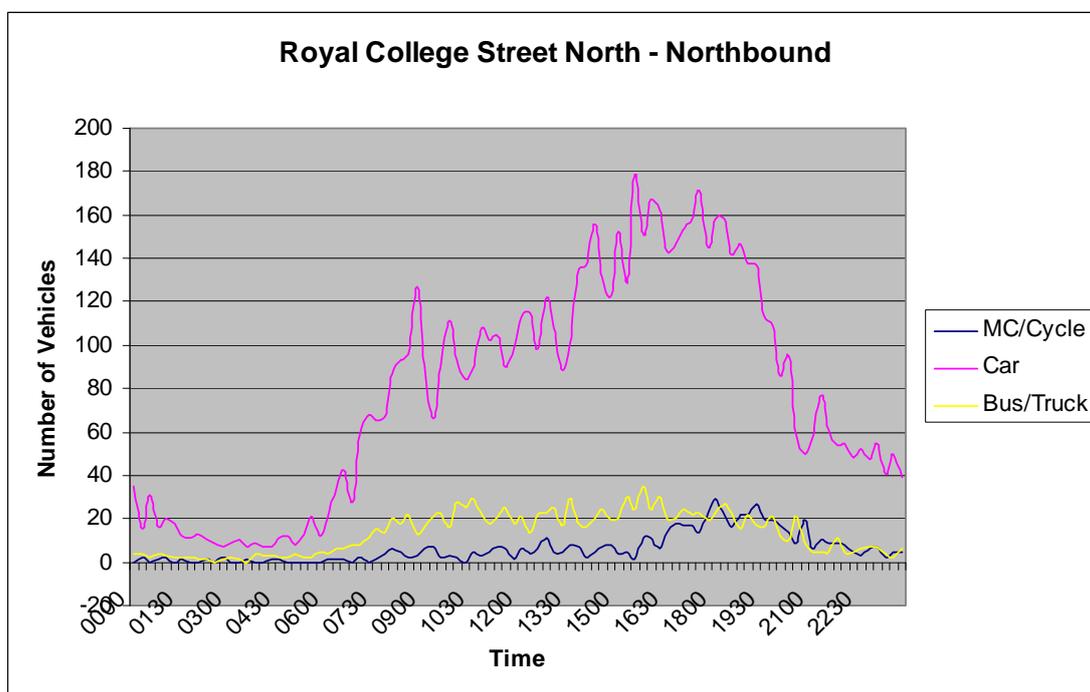
convenient. Camden Street which runs parallel to Royal College Street is one way southbound and has a mandatory cycle lane. The downhill gradient and priority of its red route status makes it popular with commuting cyclists and so many of the cyclists that use Royal College Street in the evening could be heading into central London this way. Heading northbound the red route uses Camden High Street which is a busy bus route with a lot of pedestrian activity as well as loading and unloading. This could make Royal College Street a more popular and quieter alternative. Cyclists heading southbound in the morning from Islington and heading down to St Pancras could well stay on St Pancras Way as it provides a more straightforward route towards St Pancras Station and the Kings Cross Area. Using screenline data makes it difficult to give accurate figures for modal split but it appears that cyclists make up around 10% of the traffic along Royal College Street. This is above the London average which is closer to 2% but some central London streets have a modal share of closer to 30%. The graphs below show how traffic is distributed over Royal College Street throughout the day.



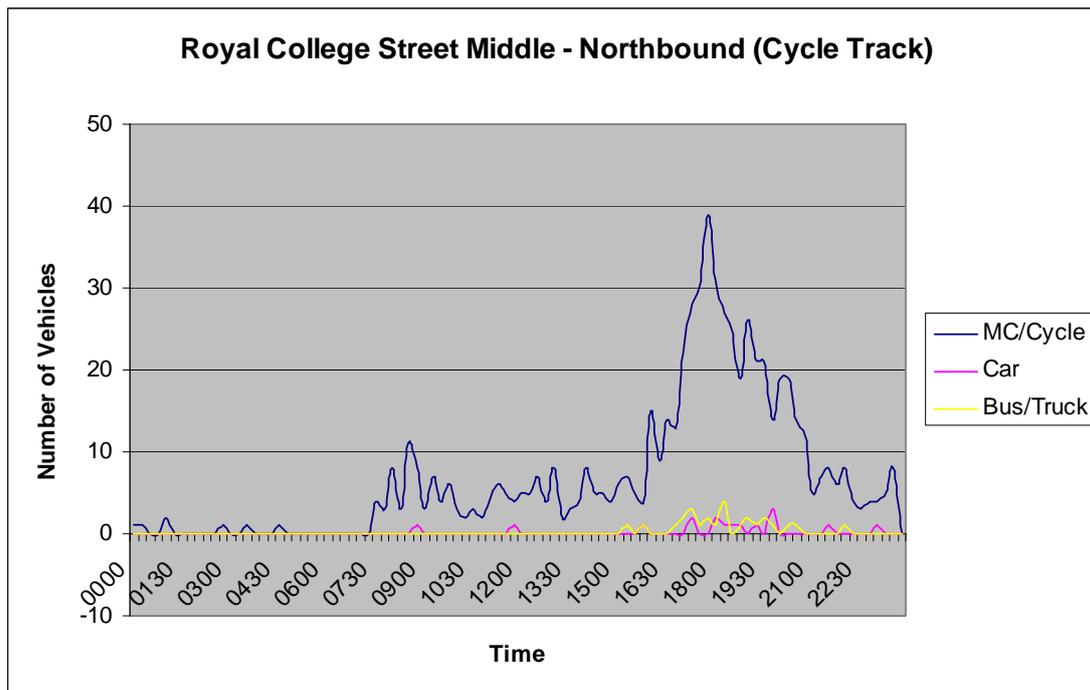
The distribution above shows no discernible peak and an even distribution. This indicates that south Royal College Street is not a commuting route but is instead functioning as a local distributor.



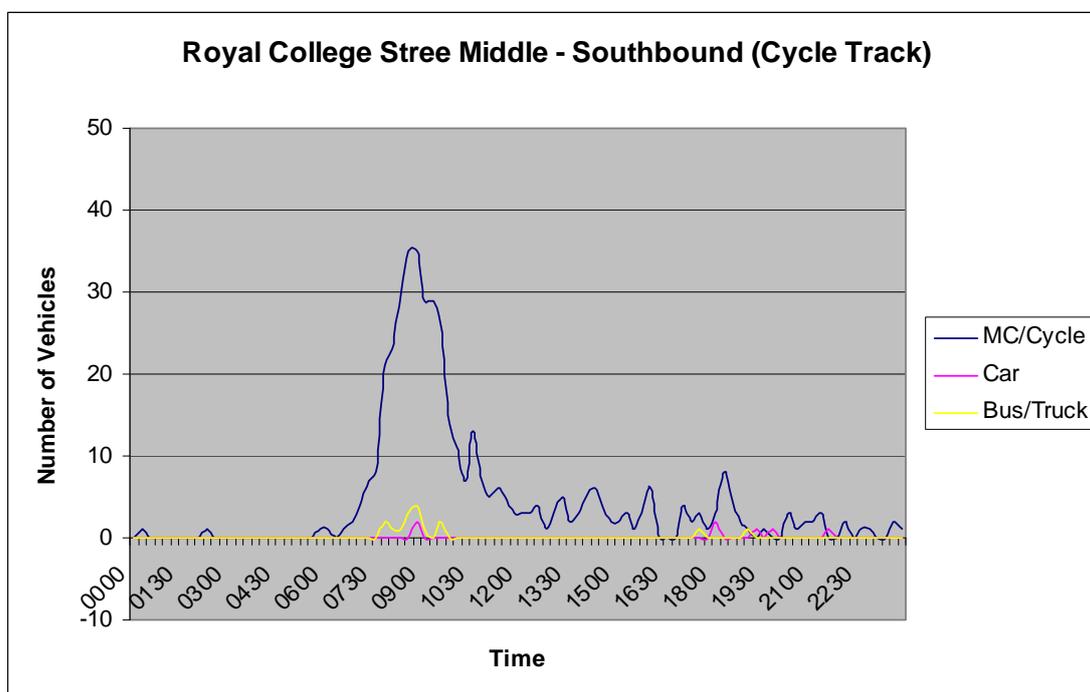
The distribution above shows a clear PM peak and so Plender Street is feeding commuter traffic heading out of central London onto Royal College Street in the evening.



The distribution above shows a distinct PM peak indicating a commuting strategic function but also constant use throughout the day so it functions as a local distributor. Royal College Street is therefore serving a dual function.



On the Cycle Track it is clear there is a distinct PM peak northbound away from central London. This distribution is associated with commuter traffic flows with little use during the day.



Heading southbound there is an AM peak which is associated with commuter traffic heading into central London. The cycle track has a typical commuter distribution curve.

Royal College Street Feasibility Report

A pedestrian survey was undertaken in February 2011 as part of the Camden Town East Feasibility work. Royal College Street north of Pratt Street was highlighted as a key strategic walking route with close to 5,000 pedestrians using it every day. Plender Street had almost 2,000 pedestrians a day and so it is clear that the northern section of Royal College Street has a greater pedestrian footfall. Its proximity to Camden town centre and the shop frontages are strong factors in determining these flows.

4. Site Observations

A site visit was undertaken on Friday 6th May to assess the client brief and examine the existing conditions. The visit took place between 11.30 and 12.30. During the visit the following observations were noted.

- There is a high proportion of LGVs and HGVs many of which were travelling at speeds approaching 30mph.
- Most drivers of vehicles exiting Plender Street and turning left onto Royal College Street were not looking left along the cycle track until they were turning.
- Vehicles were scraping their undercarriages on the raised zebra crossing to the south of Pratt Street.
- The trees at the southern end were overgrown and casting a large shadow on the footway.
- Some cyclists heading southbound from Georgiana Street and St Pancras Way appear confused about how to get into the cycle track.

5. Statistical Tests

A comparison of modal share percentage of collisions was undertaken which showed that the percentage of cyclist collisions is 56% higher than the Camden average, that is 4.8 times the rate we would expect and accounts for almost three quarters of all casualties. As cyclists make up only 10% of the traffic flow along Royal College Street, there is obviously a major contributing factor towards this numerical anomaly.

Measure	Collisions	Site	Camden	Rate
KSI	2	11.76%	15.0%	0.78
P2W	1	5.88%	26.8%	0.22
Pedal cycle	12	70.59%	14.6%	4.83

6. Summary of Safety Problems

The data presented and analysed in this report shows clearly that there is a problem with vehicles entering Royal College Street from the side roads across the cycle track. Most of the incidents imply a lack of anticipation which needs to be address in the recommendations of this report.

7. Options for Treatment

7.1 Option A – Carriageway redistribution through urban design

7.2 Option B – Upgrade existing: Prioritisation reversal across side roads

7.3 Option C – Two-way working between Baynes Street and Crowndale Road

7.4 Option D – Contra flow Cycling

8. Estimated Accident Savings

There is great debate in engineering circles about the safety of cycling specific facilities, particularly cycle tracks. It is therefore difficult to gather accurate statistics to derive accident savings from. For example John Franklyn's report on the cycle tracks and lanes around Milton Keynes over a 20 year period published in 1999 claims that using cycling specific facilities makes you 2.5 times more likely to have a collision. Simply removing the facility would therefore reduce collisions by over 50% leading to large accident savings. A more recent report from 2010 based on the Montreal cycle facilities in Canada suggests that you are less likely to have a collision on a cycle track almost 0.72 times as this report factors in the greater number of cyclists who are attracted to cycling specific facilities. Therefore removing the track would increase collisions by 28%. A Danish study carried out in 2005 looking at the safety of cycle tracks showed that their cycle tracks had increased cycling by 18-20% reducing car use by 9-10% and increasing accidents by 9-10%. This again shows the increase of collisions associated with increased numbers of cyclists. From purely a safety point of view it is difficult to justify cycling specific facilities but the benefits associated with modal shift to more sustainable modes need to be taken into account. Worldwide it is agreed that the only way to get large numbers of people cycling is through investment in segregated facilities therefore accident savings presented in this section should be weighed against this long term policy goal.

8.1 Option A – Carriageway redistribution through urban design

This option tackles many of the safety issues and root causes of collisions by displacing southbound cyclists onto the opposite side of the carriageway. As 6 of the 12 collisions on the cycle track involved southbound cyclists, including

both the serious collisions, savings should be made. In particular the poor sightlines on the approach to Royal College Street from Plender Street and Pratt Street for southbound cyclists will no longer be an issue. Motor vehicles will only need to look out for northbound cyclists travelling in the carriageway. Likewise northbound cyclists will be able to position themselves in the general traffic flow and away from the junction mouth and so should be in a better position to avoid side road junction collisions. It should be noted that cyclists will be more likely to be involved in collisions with parked cars and shunt type collisions when not segregated. As there are less side roads on the eastern side of the carriageway and cyclists are provided with segregation from motor traffic flows accident savings of 3/6 should be a conservative estimate. Northbound accident savings of 2/6 should be possible. It is anticipated that with this new arrangement the cause of both the severe collisions will be mitigated but due to the unstable and vulnerable nature of cycle use and the high numbers of cyclists using the route, collisions will continue to occur although these will be of a magnitude expected from Camden streets.

8.2 Option B – Upgrade existing: Prioritisation reversal across side roads

Option B retains the existing situation of the two-way track but attempts to mitigate for the safety weaknesses associated with this kind of facility by introducing a “four way stop” style approach where no vehicle has priority over the side road junction. Cyclists must give way to motor vehicles and motor vehicles must give way to cyclists so users pass through the junction on a first come first served system. This approach should reduce the number of skidding and failure to stop collisions on a rate of 3/6. It should also have an impact on the severity of collisions and cyclists and motor vehicles are both being instructed to modify their approach speeds. It is therefore anticipated that severe collisions will be reduced at a rate of 1/2 over three years.

8.3 Option C– Two way working between Baynes Street and Crowndale Road

This option attempts to remove collisions associated with cycle tracks by removing the facility altogether and installing a standard two way highway layout. Oncoming vehicles and the reduced lane width should have a calming effect on the traffic and so cyclists should be able to mix comfortably with two-

way motor vehicles. There is an increased risk of conflict with parked cars but side road junction collisions should be significantly reduced. It is therefore anticipated that the overall accident rate will drop to a rate of 7/14. The cause of the severe type collisions will be reduced but given the greater likelihood of shunt or door collisions involving cyclists and motorists a collision rate of 1/2 should be expected. It should be noted that this approach could reduce the number of cyclists using the route as they are no longer prioritised over general traffic flows.

8.4 – Contraflow Cycling

This option attempts to retain existing infrastructure but alter its use. If the two-way cycletrack moves to one-way then the accidents involving cyclists heading southbound on the track at side road junctions will be removed. A contra flow on the eastern side of the carriageway would run the risk of being blocked by parked cars but would greatly improve sightlines and put cyclists in a position where other road users would be expecting them. It is therefore anticipated that the overall accident rate will drop to a rate of 7/14. The cause of southbound severe collisions will be reduced but there is a greater likelihood of door collisions so a collisions rate of 1/2 should be expected. The contraflow lane should reduce speeds along Royal College Street as the carriageway will visibly narrow and so this should have additional safety benefits.

9. Estimated cost of scheme

9.1 Option A - Carriageway redistribution through urban design

Item No.	Description	Rate	Amount
	Feasibility	80hrs	£5,000
	Traffic Survey		£300
	Consultation		£7,000
	Kerb Build out	X1	£5,000
	Kerb line re-profiling	X1	£2,000
	Extra signal post and repositioning	X1	£4,000

Royal College Street Feasibility Report

	Protected turn	X1	£2,000
	Planters/streetscape	X20	£5,000
	Road marking (removal, new lining)		£2,000
	Track removal & carriageway reinstatement		£10,000
	Fees (25% of Works)		£10,575
	Scheme Total		£52,875

9.2 Option B - Upgrade existing: Prioritisation reversal across side roads

Item No.	Description	Rate	Amount
	Feasibility	80hrs	£5,000
	Traffic Survey		£300
	Consultation		£7,000
	Road marking (removal, new lining)		£2,000
	Sinusoidal profile table	X1	£3,000
	Antiskid surfacing	X2	£1,000
	Fees (25% of Works)		£4,575
	Scheme Total		£22,875

9.3 Option C - Two-way working between Baynes Street and Crowndale Road

Item No.	Description	Rate	Amount
	Feasibility	80hrs	£5,000
	Traffic Survey		£300
	Consultation		£7,000
	Signal modelling	X2	£5,000
	Signal adjustments	X2	£2,000
	Road marking (removal, new lining)		£2,000
	Track removal & carriageway reinstatement		£10,000
	Fees (25% of Works)		£7,825
	Scheme Total		£39,125

9.4 Option D – Contraflow cycle lane

Item No.	Description	Rate	Amount
	Feasibility	80hrs	£5,000
	Traffic Survey		£300
	Consultation		£7,000
	Signal modelling	X2	£5,000
	Signal adjustments	X2	£2,000
	Road marking (removal, new lining)		£2,000
	Fees (25% of Works)		£7,825
	Scheme Total		£29,125

It may be appropriate to replace all the speed cushions with sinusoidal profile speed humps. This would cost roughly £1,000 for each replacement and as there are 6 an additional £6,000 would be needed. As this route is a bus route moving away from cushions would be difficult and so this has not been factored in above.

10. First Year Rate of Return

According to DfT TAG guidance in Unit 3.4.1 the average value of prevention per road slight accident in a built up area is £20,245. For serious collisions this is £196,589. The average value of prevention per road casualty by road user gives cyclists a cost of £48,430. As most of the collisions along Royal College Street involve cyclists this figure has been used to determine accident savings below.

10.1 Option A - Carriageway redistribution through urban design

Accidents saved/annum	2.3
Cost per accident	£48,430
Total amount saved	£111,389
Cost of scheme	£52,875

Royal College Street Feasibility Report

First year rate of return	210%
---------------------------	------

10.2 Option B - Upgrade existing: Prioritisation reversal across side roads

Accidents saved/annum	1.3
Cost per accident	£48,430
Total amount saved	£62,959
Cost of scheme	£22,875
First year rate of return	275%

10.3 Option C-Two-way working between Baynes Street and Crowndale Road

Accidents saved/annum	2.3
Cost per accident	£48,430
Total amount saved	£62,959
Cost of scheme	£39,125
First year rate of return	160%

10.4 Option D-ContrafLOW Cycling

Accidents saved/annum	2.3
Cost per accident	£48,430
Total amount saved	£62,959
Cost of scheme	£29,125
First year rate of return	216%

11. Recommended Scheme

Option D is recommended as it has a high first year rate of return and provides an environment suited to all road users particularly pedestrians and cyclists, whilst removing the root causes behind most collisions particularly the severe types.