

Measure title: **Cyclist Priority in Brighton & Hove**

City: **Brighton & Hove** *Project:* **Archimedes** *Measure number:* **55**

Executive summary

This measure introduced innovative engineering measures along the city's cycle network to reduce stop-start cycling conditions, improve cycling journey times and reduce cycle conflict with other traffic. The measure forms 3 elements:

- A shared surface through a reinvented 'pocket park'.
- Innovative ramps that enable people with cycles to navigate physical barriers created by (rail bridge) steps.
- Road marking to enable cyclists to turn left at an otherwise straight ahead only junction.

Key results

Evaluation for this measure has focused predominantly on cycle counts based upon before and after video surveys conducted at the two sites. Members of the general public were also interviewed in Station Street about the impact that the pocket park scheme had had upon their perception of that area.

The results suggest that the measures in St James's Street has had a significant impact upon how southbound cycles enter into St James's Street; with a significant increase in the number of cyclists using the carriageway rather than the footway when entering St James's Street.

Overall, the installations in Station Street appear to have had a positive impact upon the general public's perception and use of this area. Previously the area was neglected and lacked a sense of purpose; the new arrangement has significantly improved the general perception of the area and allowed people to spend time there. The measure has also been successful in increasing cyclist numbers through the study area by 17% since its installation.

Lessons learned

- The design of the pocket park has successfully created an environment which balances the needs of cycles travelling through the park, and people wanting to spend time in the area. The successful design has demonstrated that different competing demands can be accommodated in compact spaces; the design has increased the number of cycles which use the cycle track rather than the footways, and the new seating and art installations have improved the general public's perception of the area too.
- The new road markings and street signage have encouraged more cycles to take a left turn at the St James St junction; the results highlight the importance of providing simple cycle infrastructure can have a significant effect upon cyclists' behaviour.
- Working in partnership with university students on the cycle ramp project was positive as it enabled new ideas to be generated. However ultimately this element was not successfully developed to implementation stage due to the inexperience of

the students. The risks of working with students on innovative projects are high and may not have been justifiable in this instance.

A Introduction

AI Objectives and Target Groups

AI.1 Objectives

The measure objectives are:

(A) High level / longer term:

To increase cycling levels in the city, and improve the health of the general public.

(B) Strategic level:

To improve cycling conditions to achieve a modal shift.

(C) Measure level:

To introduce innovative engineering measures to improve cycling conditions and reduce conflict with other road users. In order to provide a continuous cycle riding experience and increase cycling levels in the city at up to 12 intersections within the Civitas area of the city.

AI.2 Target groups

The target groups of this measure are current cyclists and potential cyclists in the city.

A2 Description

In this measure Brighton & Hove's cycle priority demonstration introduced innovative engineering measures along the city's cycle network in the CIVITAS corridor to reduce stop-start cycling conditions, improve cycling journey times and reduce cycle conflict with other traffic.

The measure formed 3 elements:

- A shared surface through a reinvented 'pocket park'. A pocket park is a piece of high quality urban realm created from a previously neglected small piece of urban land. Overcoming what was previously a physical and experiential barrier to cycling, the project provides cyclists with a physical route through an improved area for pedestrians and cyclists, and at the same time tackles the negative perceptions some people have of people using cycles.
- Innovative ramps that enable people with cycles to navigate physical barriers created by (rail bridge) steps.
- Road marking to enable cyclists to turn left at an otherwise straight ahead only junction.

The term priority is a little misleading. The project did not seek to give cycles priority over other users / uses – rather equal / appropriate priority given the context of each intervention location. A better way of understanding the cycle priority measure is that the elements within seek to create an appropriate balance between provision for people on cycles and other users / uses of public spaces.

Two of the elements (pocket park and cycle ramps) overcame physical barriers to cycling (raised kerbs and station steps respectively). All elements give cycles advantage over motorised vehicles in opening routes that are inaccessible to motorised vehicles. None of the locations saw cyclists benefit at the expense of anyone else.

Station Street (the site of the pocket park) is located to the east of Brighton Rail Station. The cycle route connects the rail station / south of the city with the north and west of the city.

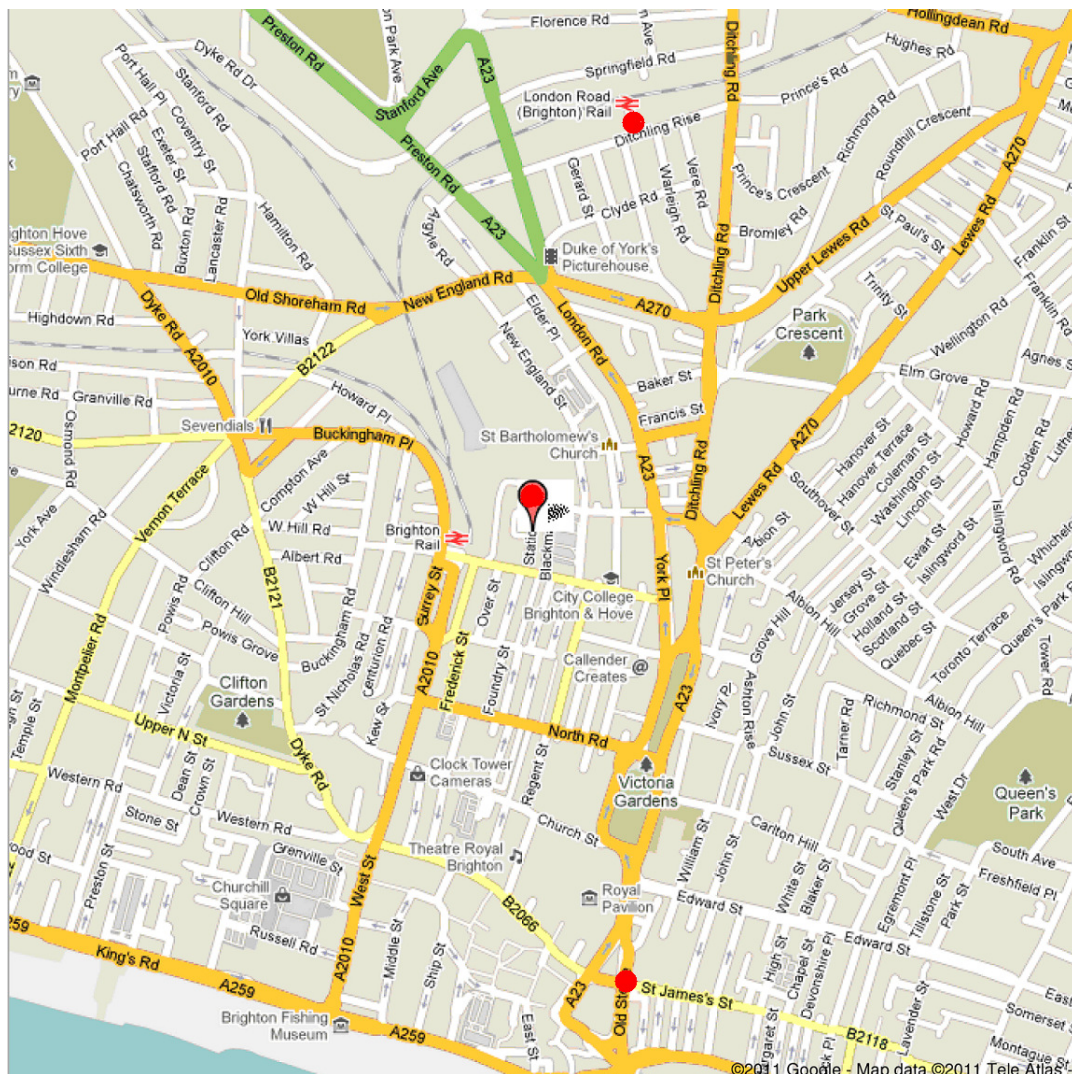


Figure 1: Map of the intervention. The southern red dot shows the location of the St James St cycle left turn. The northern red dot shows the intended location of the cycle ramp. The red arrow shows the location of Station Street.

The pocket park element saw a shared surface created with dropped kerbs at either end to allow cycle access through the space without need for dismounting. Street clutter (primarily bollards) was removed and replaced with positive street elements such as enhanced seating and a tree. An art commission challenged negative perception of cyclists whilst enhancing the quality of the space for all users.

As well as removing physical barriers to cyclists (the raised kerbs / unpleasant ambience), the project also attempts to redress the negative view some people have of people on cycles by encouraging pedestrians and cyclists to share the space, and incorporating a piece of artwork that adds humour to the relationship between cyclists and other users of the space.

The left turn priority for cyclists required new signage and a cycle lantern. Prior to the measure, at this junction, cycles had to obey the same traffic rules as motorised vehicles, despite it being safe for cyclists to turn left. This project gave cyclists priority to pull away from the junction before other traffic and to make the left turn.

Prior to the measure the junction of Old Steine and St James's St was an unnecessary barrier to continuous cycling as cyclists are stopped, along with all other traffic, at the signals and are not permitted to turn left from Old Steine into St James's Street. The project installed specific cycle signals allowing cyclists to proceed ahead of other traffic, and allowing cyclists to make the left turn manoeuvre.

B Measure implementation

B1 Innovative aspects

- New conceptual approach - In this measure Brighton & Hove's cycle priority demonstration will introduce innovative measures along the city's cycle network that has not been used in the city before. Mobility management: the best use of existing infrastructures with small management and design actions.
- Use of new technology/ITS - In this measure Brighton & Hove's cycle priority demonstration will introduce innovative technology along the city's cycle network.
- Targeting specific user groups – this measure will mainly target cyclists or potential cyclists who would be cycling instead of driving to commute.
- New physical infrastructure solutions - In this measure Brighton & Hove's cycle priority demonstration will introduce innovative engineering measures along the city's cycle network.

The innovative aspects of the measure are:

- **Innovative aspect 1** – this measure will introduce innovative solutions that have never been used in Brighton & Hove before.

B2 Planning of Research and Technology Development Tasks

Not applicable.

B3 Situation before CIVITAS

Cycling levels are increasing in the city and there is a demand for cyclist priority measures to provide a continuous cycle riding experience. The City Council monitors cycle journeys at 22 points across the city, and collects this data quarterly. Results indicate substantial increases in cycling along key routes in the Civitas+ corridor: typically 47% between the years 2000 and 2008, with several routes recording over 2,000 daily cyclists. The city has an identifiable Academic Corridor with several universities and colleges along the route and it appears that this corridor could be particularly suitable for cyclist priority treatment.

The pocket park element is located in an area that was drab and cluttered (and so dissuaded people from spending time) and inaccessible to cyclists due to raised kerbs at the southern end of the street.

The cycle ramp element of the project aims to remove barriers for cyclists in various locations throughout the city where steps exist. Steps can be a real barrier for cyclists travelling around the city and this is particularly problematic at rail bridges, where cyclists must carry their bikes up and down the steps when accessing or exiting the station platforms. Rail bridges can also provide useful short cuts for cyclists wanting to travel from A-B using the shortest route; these cycle ramps attempt therefore to reduce the length of the cyclists' journey. The current cycle ramps that do exist in some locations throughout the city are of a poor quality and are often not used due to the design flaws. This project attempts to overcome these design flaws and produce a cycle ramp design which will be accessible for cyclists.

The cyclist left turn project will ensure that the green phase for cyclists is longer, and also will prevent cyclists having to dismount, or travel a circuitous route to make the left turn. The Old Steine / St James's Street junction is at the southern end of the academic corridor and a significant barrier to continuous cycling. This project will help reduce stop-start cycling for cyclists travelling between Kemptown and the university area.

B4 Actual implementation of the measure

B4.1 Pocket Park

The pocket park measure will be implemented in the following stages:

Stage 1: Preparation (November 2010-January 2011)

Video analysis of the area was carried out in winter 2010. Observations of pedestrian and cycle desire lines were used to inform the re-design of the pocket park. The below pictures are of Station Street before works commenced:



Figure 2: Station Street before the installation of seating and the mosaic



Figure 3: Station Street after the installation of the new seating and the mosaic

Stage 2: Decision making (September-October 2011)

During Spring 2011 a tendering process was started to appoint an artist to install a mosaic. An artist was appointed in September 2011 and the design pictured below was installed in October 2011.

In November 2011 on-street consultation was carried out to inform the detailed design of seating provision. Local businesses and passers-by were engaged and asked for their views on what should be provided. Chairs were placed on the street so that consultees could experiment with different seating arrangements. As a result a seating brief was prepared and a street furniture designer was commissioned to design and install the seating element.

Unfortunately it was not possible to remove a telecoms utility box in the pocket park. Therefore an artist was commissioned in December 2011 to enhance the appearance of the box, resulting in the reproduction of the Manet painting *Le Dejeuner sur l'Herbe* on the northern side of the box.

Stage 3: Implementation (September 2011, and April 2012)

In early 2011 redundant street furniture and clutter was removed. The pocket park was repaved, with dropped kerbs provided, a tree was added, along with good quality cycle parking. The artwork, a mosaic, was installed (the concrete base for the mosaic is currently setting). Seats were installed later in April 2012.

Stage 4: Evaluation (July 2012)

Evaluation work commenced once the final work had been completed on the hard measure, the evaluation included:

- Video Monitoring of users' behaviour in Station Street
- Qualitative surveys of users in Station Street

B4.2 Cycle Ramps

The cycle ramps measure have been implemented in the following stages:

Stage 1: Preparation (January 2010 – September 2010)

Research and consultation into innovative engineering solutions to provide priority for cyclists at 12 intersections in the Civitas area of Brighton & Hove

In January 2010 Brighton and Hove University lecturer for technology and design was contacted and to determine interest in asking students to enter a design competition for the Cycle Ramps as part of their second year design course.

In February 2010 design students were issued with a design brief to create a workable solution to assist in transporting bikes up stairs. London Road rail station steps were chosen as a staircase on which to design their product, it was made clear that any design should be made with the intention to roll-out across various locations where steps presented a barrier for cyclists.

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In September 8 groups of students presented their designs to a panel of judges including; CIVTAS project managers, Brighton & Hove City Council Walking and Cycling officer, Highway engineers and Southern Rail facilities manager.

The panel agreed on the final winning design and offered the design students collectively named as Flow Creations, who came up with the Wave Design.

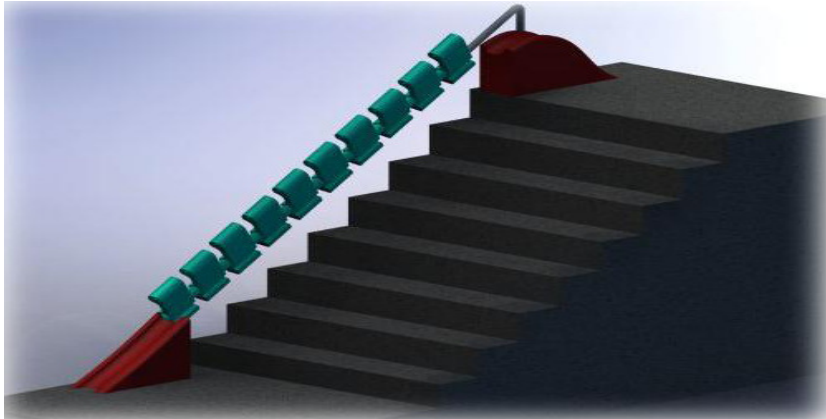


Figure 4: Image of the winning ramp design

With assistance from the BHCC highways engineering team the design was refined and amended.

Stage 2: Decision making (September 2010: April 2011)

Choosing the sites, the measures to be implemented, and the suppliers.

The site locations where chosen where there was an obvious requirement for cycle access or travel within the CIVITAS area and Falmer Rail Station, London Road Rail Station and Preston Park Rail Stations were all chosen as potential locations where cycle stand should be implemented.

If the prototype was successful, the ramps could have been implemented at all 3 stations and there was a possibility of including other stairs in the city where stairs create a barrier between cycle routes, such as Madeira Drive.

Stage 3: Implementation (April 2011 – September 2011)

Implementation of innovative engineering solutions to provide priority for cyclists at 12 intersections in the Civitas area of Brighton & Hove and carrying out of the publicity campaign

The Prototype was trialled at the University of Brighton site in April 2011. Although the design looked promising when trailed on a life sized basis there were technical problems with the moving mechanisms of the ramp.

Following this trail the design has been amended and there were plans to see the final design for the Prototype before the end of September.

The initial design was as follows;

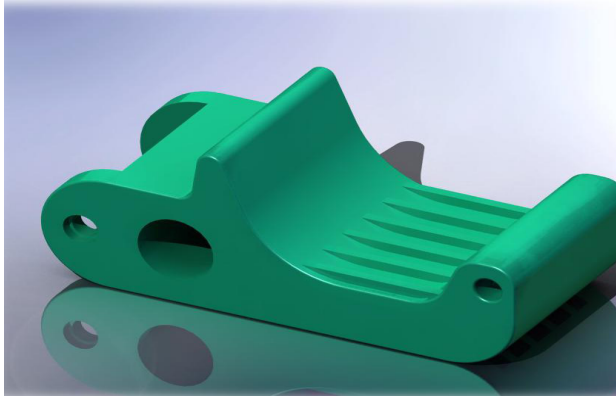


Figure 5: Image of the ramp module initial prototype.

The individual mechanisms are designed with a Raised lip to allow easier use of the ramp by allowing the bike to be at an angle.

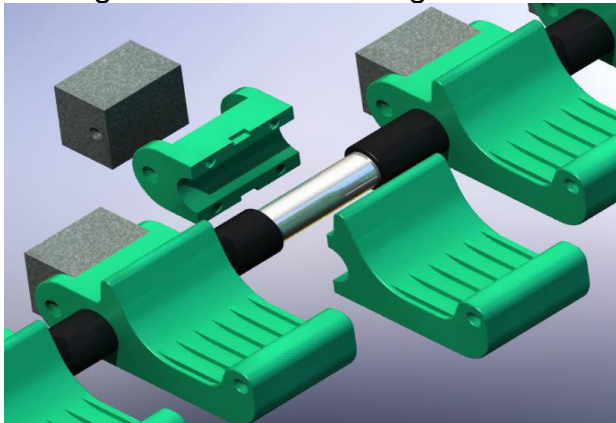


Figure 6: Model of the ramp module final prototype.

Sections were then fixed to a solid pole and weighted to allow movement, Individual parts that create a “wave” effect as the user goes up the stairs.

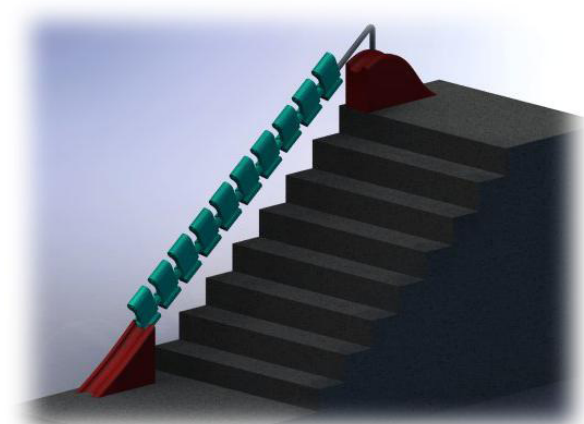


Figure 7: Image of the winning ramp designs.

The fixture was designed in sections to allow adaptation so that it can be installed on a range of staircases (see figure 5)

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Stage 4: Evaluation (September 2011- April 2012)

The evaluation of the project was ultimately not possible in its originally intended form as the ramps were not installed in public. Although the conclusions of the measure are that the ramps were not successful it may still be possible that an experienced designer could develop the plans into a feasible design.

B4.3 Cyclists' Left Turn

The cyclists' left turn measure was implemented in the following stages:

Stage 1: Preparation (16/02/09 – 15/09/10)

Research and consultation into innovative engineering solutions to provide priority for cyclists at 12 intersections in the Civitas area of Brighton & Hove

Consultation was carried out during autumn 2009 with the council's Walking & Cycling Officer and Traffic Signals Officer. Through this consultation the left turn at St James's Street was identified as an area where cyclists are subject to significant stop-start conditions, and further consultation identified the proposed measure.

Suppliers were identified through the Traffic Signals team, who have significant experience of procuring cycle signals.

Stage 2: Decision making (16/09/10 -15/11/10)

Choosing the sites, the measures to be implemented, and the suppliers.

On January 26th 2010 political approval was granted to proceed with all cyclist priority schemes.

Suppliers were commissioned in March 2011.

The project is situated at the junction of Old Steine and St James's Street. The Old Steine is part of the key north-south cycle route through the centre of Brighton.

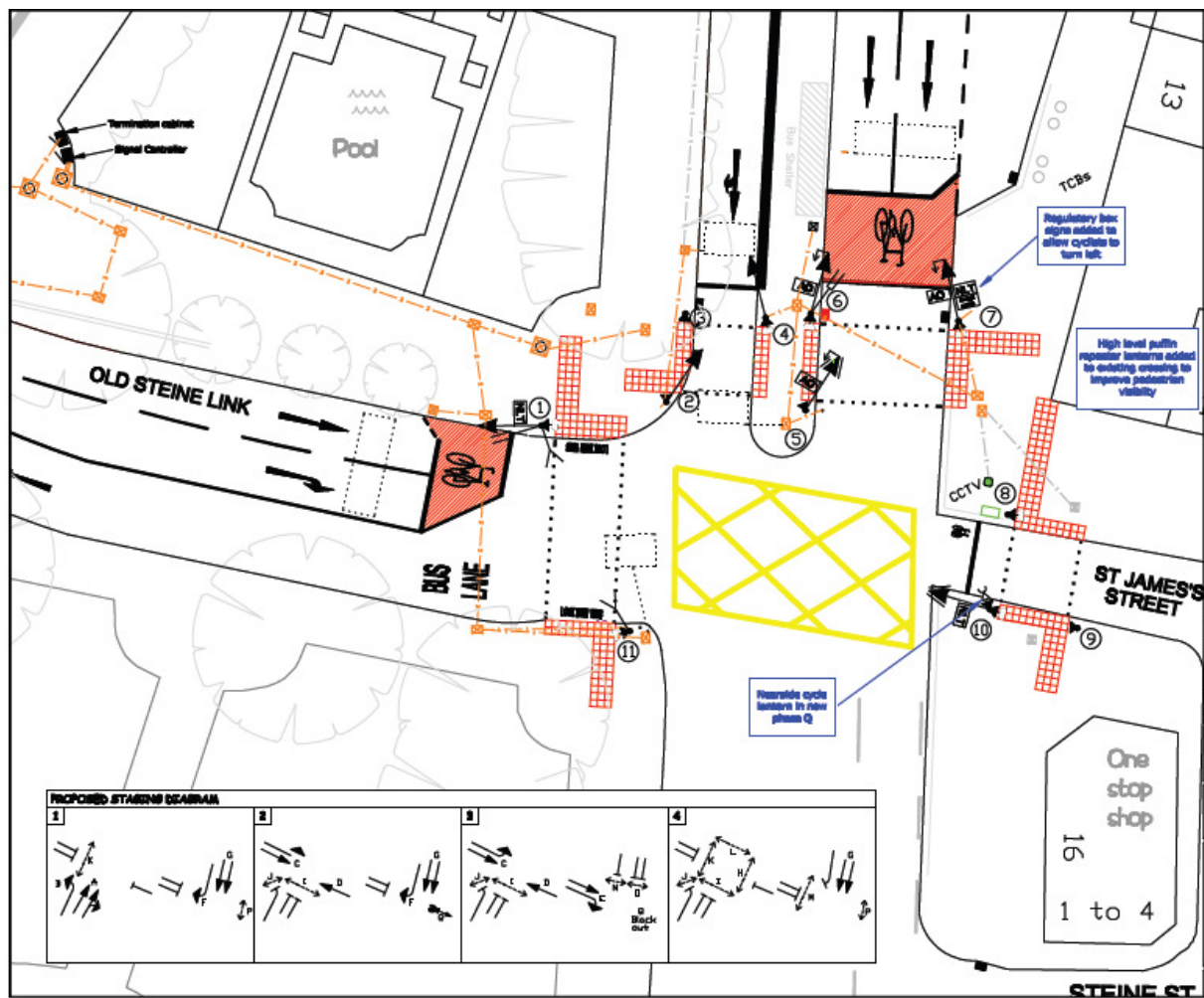


Figure 8: Plan of the signals design.

Stage 3: Implementation (1/08/11 – 1/09/11)

Implementation was carried out in August 2011, however there were initial problems with the software. The scheme was eventually fully operational in July 2012.

Stage 4: Evaluation (15/08/11 – 15/09/12)

- Video Monitoring of cycles’ behaviour

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure DSS 24 (Donostia-San Sebastian)**
This measure also addresses a City Bike network design.
- **Travel Plans (measure BH 32)**

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Linking to school travel plans will provide education information to pupils, parents and teachers about how to use the cycle priority measures, and encourage use of cycling.

Linking to commuter travel plans will provide education information to employees about how to use the cycle priority measures, and encourage use of cycling.

- **Personalised Travel Planning (measure BH 31) & Personalised Travel Information Website (measure BH 71)**

Awareness of the project will also be increased through Personalised Travel Planning and JourneyOn (website).

- **Bike Off (measure BH 44)**

Enhancements will complement BikeOff in encouraging greater numbers of cyclists.

At the measure level: In Aalborg (measure 51), the ARCHIMEDES project will focus on design of a commuter route for cycling in the corridor between the city centre and the university. This includes traffic signals, dedicated cycling lanes, signposting, shortcuts, sheltering, services, and safety measures to form a “cycling motorway” in Aalborg. It is also expected that quantifiable improvements in travel time and cyclists’ safety will be realised due to the measure.

Iasi (measure 59), Usti (measure 60) and Monza (measure 62) will also provide some facilities for cyclists.

C Planning of Impact evaluation

CI Measurement Methodology

CI.1 Impacts and Indicators

CI.1.0 Scope of the Impact

The indicators will establish public understanding and acceptance of the measure. Monitoring data will add information on the impact upon cycle travel time, modal split, and congestion.

Economy: The capital and maintenance costs of the three elements will be recorded and measured against the social and transport related benefits.

Society: Awareness and acceptance surveys will be conducted in order to test the extent to which the target groups are aware of and understand the different elements, and also whether they are perceived as a success or not. Some barriers to innovative travel solutions can be a lack of understanding and therefore this must be explored in the impact evaluation.

Transport: Transport surveys will focus on the impact made upon the flow levels and modal split of traffic in the surrounding areas of the initiatives. Congestion will also be considered, along with road safety. These are all important to investigate as changes to the prioritisation of the transport system could have a multitude of knock-on effects.

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CI.1.1 Selection of indicators

NO.	EVALUATION CATEGORY	EVALUATION SUB-CATEGORY	IMPACT	INDICATOR	DESCRIPTION	DATA /UNITS
ECONOMY						
2b		Costs	Capital Costs	Capital costs	Costs per annum	Euros/annum, quantitative, measurement
2c			Maintenance costs	Maintenance costs	Costs per annum	Euros/annum, quantitative, measurement
SOCIETY						
13		Acceptance	Awareness	Awareness level	Awareness of the policies/measures	Index (%), qualitative, collected, survey
14			Acceptance	Acceptance level	Attitude survey of current acceptance of the measure	Index (%), qualitative, collected, survey
TRANSPORT						
20		Safety	Transport Safety	Injuries and deaths caused by transport accidents	Number of accidents, fatalities and casualties caused by transport accidents	No, Quantitative, measurement
21		Transport System	Traffic Levels	Traffic flow by vehicle type - peak	Average vehicles per hour by vehicle type - peak	Veh per hour, quantitative, measured
22				Traffic flow by vehicle type - off peak	Average vehicles per hour by vehicle type – off peak	Veh per hour, quantitative, measured
23			Congestion Levels	Average vehicle speed - peak	Average vehicle speed over total network	Km/hr, quantitative, derived
24				Average vehicle speed - off peak	Average vehicle speed over total network	Km/hr, quantitative, derived
29			Modal split	Average modal split-trips	Percentage of trips for each mode	%, quantitative, derived

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CI.1.2 Methods for evaluation of indicators

No.	INDICATOR	TARGET VALUE	Source of data and methods	Frequency of Data Collection
13	Awareness level	Public	Online survey advertised on the council/JourneyOn website	After
14	Acceptance level	Public	Online survey advertised on the council/JourneyOn website	After
20	Injuries and deaths caused by transport accidents	Impact cycle use	Via existing traffic level monitors/reports	Before and after
21	Traffic flow by vehicle type - peak	Impact cycle use	Via existing traffic level monitors/reports	Before and after
22	Traffic flow by vehicle type - off peak	Impact cycle use	Via existing traffic level monitors/reports	Before and after
23	Average vehicle speed - peak	Improve the management of traffic within the city centre	Via existing traffic level monitors/reports	Before and after
24	Average vehicle speed - off peak	Improve the management of traffic within the city centre	Via existing traffic level monitors/reports	Before and after
29	Average modal split- trips	Impact on cycling levels	Via existing and new cycling level monitors/reports	Before and after

CI.2 Establishing a baseline

The baseline will be established around an approach to appraise the existing cycling environment in Brighton & Hove in order to assess any improvements in conditions, and ultimately any increase cycling levels.

Baseline data collection will therefore focus around existing traffic level monitors/reports for:

- Injuries and deaths caused by transport accidents
- Traffic flows (peak and off-peak)
- Traffic speed (peak and off-peak)
- Modal Split (trips)

As one of the target groups for this measure are existing cyclists, it will be important to monitor the number of cyclists already present in the particular areas of intervention (the academic corridor), as well as in the city as a whole.

CI.3 Methods for Business as Usual scenario

Related BHCC initiatives/works and their potential impacts:

- Cycling England funds/work programme creating greater/improved provision for cyclists – Advance Stop Lines (ASLs), new cycle lanes, increased cycle parking, cycle training in schools (Bikeability),
- Local Sustainable Transport Fund (LSTF). New funding for sustainable transport initiatives focussed on the academic corridor. Most works will be post-Civitas timeframe however there could be some impact upon post data collection.
- Local Transport Plan (LTP). City targets for transport which include reducing single occupancy car journeys and increasing cycling. It also includes targets for improving air quality in Brighton & Hove. The work packages that are driven by the LTP will inevitably impact upon the findings of all of the CIVITAS measures.

External factors and their potential impacts

- Bike Train – independent cycling group traversing the academic corridor at commuter hours. Encouraging cycling through the idea of safety in numbers.
- National and international commitments to tackling global warming and reducing emissions – political support for sustainable transport solutions, more funds available.
- Increasing cost of fuel – as standard forms of fuel become more and more expensive there is likely to be a shift to more sustainable transport usage.
- Green administration newly elected in Brighton & Hove (May 2011) – on a local level, the new administration in Brighton & Hove are likely to look much more favourably on sustainable transport schemes.
- Cycling levels, particularly on the academic corridor in Brighton & Hove are greatly affected by seasonal variations. The spring and autumn months see the largest numbers of cyclists as this coincides when most users (students) are currently at college/university. The summer and winter months invariably see number of cyclists

significantly drop (potentially due to students returning home to their families or simply not having to make the journey to and from college). This is in contrast to the patterns experienced else where in the city where the summer months always receive the largest numbers of cyclists (particularly along the seafront cycle route).

C2 Measure results

C2.1 Economy

C2.1.1 Costs

Table C2.1 Costs

Indicator	Before (date)	B-a-U (date)	After (date)	Difference: After-Before	Difference: After-BaU
2b Capital costs – St James's Street			40,480 euros		
2b Capital costs – Cycle Ramps			23,380 euros		
2b Capital costs – Station Street			14,890 euros		

At the point at which this report was written (Oct 2012) there have been no maintenance costs.

C2.2 Society

C2.2.1 Acceptance

Table C2.2 Acceptance

Indicator	Before (2010)	B-a-U (date)	After (2012)	Difference: After-Before	Difference: After-BaU
13 Awareness level – Station Street	40%	40%	55.4%	15.4%	15.4%
14 Acceptance level - Station Street	28.6%	28.6%	86.6%	58%	58%

Station Street

Awareness/Acceptance survey

Methodology

- In total 60 people partook in the study; 30 before the works were undertaken and 30 after the works had been completed. We asked anybody that was passing through

the site, or spending time in the area whether they would like to be interviewed. It was difficult to identify willing participants in the *before* section because there was nowhere to sit or spend time in the area, which meant that we had to interview people as they passed through; most people were 'rushed' or 'too busy' to partake in the questionnaire. It was easier to identify participants in the *after* section because users actually had some where to sit, we decided to limit the sample to 30 participants in the after section for consistency.

- The fieldwork was designed to allow comparison of the general public's perception of the study area before and after the changes to the area. The before questions focused on the general public's perception of the study area prior to the installation of seating, the questions were designed to gauge how the sample felt about the area and what could be done to improve it. The after questions focused on whether changes to the area had had an impact upon the general public's perception of the study area.
- An example of the survey questions is attached as Appendix I.

Findings

Q.1. Had you spent time in the study area before the installation of the new features?

- 60% of the sample had never spent time in the area, 34% had spent some in the area and 6% had spent a lot of time in the area. These figures formed the awareness aspect of the evaluation.
- There was a 15.4% increase in the amount of people that had spent time in the area, the provision of new seating was cited as the main reason for people choosing to spend time there. As before, the main reason people were spending time in the area was because they either worked locally or were using local shops/services.
- There was still a core group amongst those that had never spent time in the area that felt that the study area wasn't a nice place to spend time, and it felt like it would take a lot to change their opinions on the area.

Q.2 If so, where there any aspects which you did/ didn't particularly like?

- Of the 25.6% of the sample that had spent time in the area previously; 71.4% of comments were negative. 60% of these negative comments referred to the poor physical state which the Study area was in;
 - benches were rotting and broke
 - there was a lot of litter
 - the surrounding buildings were poorly maintained.
- 86.6% of people had a positive view of the area after the scheme was installed.

- The remaining negative comments focused on the negative influence of the Street Community on the space. The old benches were actually removed from Station Street because a small group of the Street Community vandalised the benches to a point that they couldn't be used anymore.
- Only 20% of the sample spoke positively about Station Street's previous layout (i.e. Before the old civic benches were damaged and subsequently removed). Positive respondents generally felt the space was fine and fit for purpose, it was just a place to sit.

This question informed the acceptance figures.

Has the new design had any impact upon your opinion of the area?

58% of participants agreed that the changes had improved their perception of the site, 35% were indifferent to the changes, and 7% said the changes had worsened their opinion. The benchmark for improvement was set relatively low, 71.4% of comments were negative about the area in the first round of consultation.

Of the 58% who had improved their opinion of the area, 68% said they were happy to see positive change in the area, 20% were impressed with what had been achieved in the small area, and 8% were glad to have somewhere to sit.

Questions 3/4 What *qualities* in a public space would increase the likelihood of you spending time in that area?

'Qualities' was generally understood as either physical qualities i.e. Seating, water features or as atmospheric qualities i.e. Ambience, relaxing etc. If a participant tended to focus on one quality (which they generally did), we would suggest them in the direction of the other qualities too. For example; *A space would need to be somewhere quiet and peaceful where I could eat my lunch.* And so if you would eat your lunch there, what physical qualities might it need? *It would have wooden seating and some vegetation.*

Initially questions three and four were designed to ask initially what people would like to see generally in the public realm, and then to move onto to what they would like specifically in Station Street. However this questioning confused participants and we weren't getting the kind of responses that we had hoped. Instead the question was changed to ask what qualities a public space would need in a public space, such as Station Street. Qualities was chosen because it didn't wasn't specific and was therefore open to the participants' interpretation.

The results highlight the relative importance of vegetation and seating in the public realm; 58.4% of responses referred to either vegetation or seating. The proportion of participants that chose seating or vegetation is impressive given that users could have chosen any *quality* which they wanted in Station Street.

The remaining 41.6% of comments give interesting food-for-thought in terms of what more quirky features attract users to spaces. These answers felt far more personal, and respondents were able to articulate these answers far better than just saying 'seating' or

‘more trees’. For example the lady that wanted a canopy knew exactly what kind of canopy she wanted, where she had seen a similar canopy, and even had a rough estimate of costs too! The point being that these remaining answers illustrate how users develop very personal relationships with specific elements in spaces, and that this relationship often explains why somebody is in that space in the first place.

Respondents seemed to find it easier to identify emotional qualities compared to physical qualities; their answers were generally quite simple and concise.

C2.2.2 Safety

In the original proposal road safety figures were due to be evaluated. However it was felt that with the removal from the Green Wave element from the measure (see deviations) that the replacement elements were too small scale for road safety figures to be relevant.

C2.3 Transport

C2.3.1 Transport System

Video footage was collected over a 24 hour period in both Station Street and St. James Street, 15 minute samples were then observed for each hour. The below figures represent the total for 24x15 minute samples. ‘Legal Cyclists’ in Station Street refers to cyclists using the prescribed cycle track, whilst ‘Illegal cyclists’ refers to cyclists which used the pedestrian footways instead.

A comparison of cyclists on Richmond Place, a nearby road was made. Between 2010 and 2011 peak hourly flow of cyclists increased from 134 to 163- an increase of 21.6%. This figure was used to calculate business as usual figures for cyclist numbers.

Table C2.3 Cycle Counts: Station Street

Indicator	Before (Jan 2011)	B-a-U	After (May 2012)	Difference: After-Before	Difference: After-BaU
21 Traffic flow – legal cyclists per hour	32	39	52	20	13
22 Traffic flow – illegal cyclists per hour	32	39	23	-9	-16

Table C2.4 Cycle Counts: St. James Street

Indicator	Before (March 2011)	B-a-U	After (Aug 2012)	Difference: After-Before	Difference: After-BaU
21 Traffic flow – cyclists making	0	0	60	60	60

manoeuvre legally per hour					
22 Traffic flow – cyclists making manoeuvre illegally per hour	36	44	60	24	16

N.B. ‘Legal Manoeuvre’ refers to cycles which used the road, whilst ‘Illegal cyclists’ refers to cyclists which cycled over the pedestrian footway instead.

Business As usual

A comparison of cyclists on Richmond Place, a nearby road was made. Between 2010 and 2011 peak hourly flow of cyclists increased from 134 to 163- an increase of 21.6%. This figure was used to calculate business as usual figures for cyclist numbers.

Station Street Video Survey Results

The video analysis compared cycles’ behaviour before and after the installation of seating in the ‘Pocket Park’ area. Video footage was collected for a 24 hour period, 15 minute samples were then observed from each hour slot.

Table C2.5: Station Street Survey Results

Station Street	Before		After	
Time (24h)	Used cycle-track	Used Pavement	Used cycle-route'	Used Pavement
1	0	0	0	1
2	1	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	1	1	0	0
7	0	1	1	2
8	2	5	3	3
9	4	2	7	2
10	0	1	1	1
11	0	1	2	1
12	1	0	2	0
13	1	1	2	1
14	2	1	4	1
15	2	1	3	0
16	3	1	2	0
17	3	9	18	3
18	3	4	7	4

19	0	3	2	2
20	0	1	1	2
21	3	0	0	0
22	0	0	0	0
23	2	0	0	0
24	4	0	0	0
Sum	32	32	55	23
Percentages	50	50	70.51	29.49

Findings

- The video surveys recorded how cycles entered St James’s Street during peak hours, based on 15 minute samples. The new facilities were installed at the junction to improve cycle access in the area, the purpose of the surveys was to observe whether the facilities had an impact upon cyclists’ behavior.
- The results show that there was an increase the number of cycles which used the road between the before and after surveys, however there was a more significant increase in the number of cycles which short-cutted across the footway into St James’s Street. It is worth noting that the weather was particularly bad during the after video survey day which explains the slight decrease in the number of cycles using St James’s Street. Table 2 presents the findings from the two sets of video footage.
- Video footage was collected for a 24 hour period, 15 minute samples were then observed from each hour slot. The below figures represent the morning and evening peak periods when it was felt that the facility would be at it’s busiest:

Table C2.6: St. James Street: Video Survey Results

Time	St James’s Street		Southbound and cut across pedestrian footway		Southbound and used the road	
	Before	After	Before	After	Before	After
6	2	2	0	2	0	0
7	5	7	0	3	0	2
8	7	5	0	2	0	3
9	6	9	0	2	0	1
17	18	5	4	3	0	0
18	5	5	1	3	0	2
19	4	7	1	0	0	1
20	5	7	3	0	0	0
Sum	52	47	9	15	0	9

C3 Achievement of quantifiable targets and objectives

No.	Target	Rating
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1	Increase cycling levels in the city	*
2	Improve cycling conditions in the city	*
3	Achieve a modal shift	Currently unknown
4	Reduce conflict with other road users	*
5	Provide a continuous cycle riding experience at up to 12 intersections within the Civitas corridor.	○
NA = Not Assessed ○ = Not Achieved * = Substantially achieved (at least 50%) ** = Achieved in full *** = Exceeded		

C4 Methods for up-scaling

These cyclist priority innovations could be extended to include other areas of the city, outside of the Civitas corridor. The information could be connected to national policies and /or experiences in other UK cities.

Usage figures and acceptance surveys will go a long way to understanding whether similar innovative travel solutions could be implemented in other parts of the city, and whether they would make any difference to the cycling network.

The technology/practices used for the three elements are flexible enough to be adapted to a variety of different scenarios e.g. the cycle ramps have been specially designed to cope with different sized sets of steps.

A key output from the evaluation will be to assess whether the cost of implementation and maintenance will be worth the overall impact on the transport environment. When this has been established it will be possible to rate these cyclist priority measures against other schemes attempting to achieve similar results.

C5 Appraisal of evaluation approach

Following the change in emphasis of the measure a number of changes became necessary for evaluation. Road safety data was originally included in the evaluation plan and would have been an appropriate indicator for the success of Green Wave. However the smaller-scale elements that replaced Green Wave would not have had enough impact for road safety to be a reliable indicator.

Instead, behaviour analysis was carried out using video surveys. This proved to be a successful evaluation element as the way in which people used Station street could be analysed as well as the quantity of users. For St James's Street video surveys worked well as we were able to analyse how people used the junction (whether they used the turning at all, used it legally, or used it illegally). Analysis of this type worked better than on-street surveys as actual behaviour could be assessed.

Ideally we would have been able to compare the before and after opinions of the same participants for the Station Street survey- however few participants from the before group

were willing to leave their contact details with us. This means that direct comparison between the findings from the two sample groups are limited.

C6 Summary of evaluation results

St James's Street: The results suggest that the measures in St James's Street has had a significant impact upon how southbound cycles enter into St James's Street. A significant increase in cyclists overall has been noted. However 50% of cyclists are still choosing to make the illegal shortcut across the footway. The video footage suggests that this shortcut lies on the direct desire line for southbound cyclists entering St James's Street, and so therefore the shortcut presents a more direct and also more comfortable route for cyclists to take, than taking the more acute route on the road.

Station Street: Overall, the installations in Station Street appear to have had a positive impact upon the general public's perception and use of the study area. Previously the area lacked a sense of purpose, the new arrangement has allowed people to spend time there which in turn has brought some life back into Station Street. The measure has been successful in increasing cyclist numbers by 17%.

C7 Future activities relating to the measure

The Station Street element has been successful in transforming a piece of under-used land into an attractive city centre area. The methodology used for this element will be applied elsewhere in Brighton & Hove.

The St James's St left turn has also been successful in fixing a gap in the cycle network. This methodology will be used elsewhere in the city at similar locations.

The cycle ramps element will not be pursued by the city council. Unfortunately it was not felt that the design could be taken any further by the university students.

D Process Evaluation Findings

D0 Focused measure

X	0	No focussed measure
	1	Most important reason
	2	Second most important reason
	3	Third most important reason

D1 Deviations from the original plan

The deviations from the original plan comprised:

- No longer implementing originally planned 'Green Wave'. Implementing a green wave for cyclists, allowing them to follow a set of lights in the ground that would enable a cyclist to reach all traffic signals along a route during their green phase was an original intention of the scheme. However early feasibility work showed that the measure would be much more costly than originally anticipated due to the engineering works required in the specific intended location and it was not progressed.
- Reduction in the number of measures implemented due to the Green Wave not going ahead.
- The cycle ramps element did not progress to implementation. The student team produced a design that was considered feasible and made good progress in implementing it. The prototype was developed to a stage where it was able to be fixed to steps and partially used- this means that a cycle could be pushed up the ramp but considerable effort was required and the mechanism to load the bike on to the ramps did not work reliably enough. The student team made several iterations of the prototype, however the problems were never fully resolved and it became clear that the student team did not have the required skills to take the project to full implementation.
- Timescales have slipped from original plan as a result of the initial issues with instalment of Green Wave.
- Data wasn't collected for indicators 23, 24 and 29 because as the measure evolved these indicators became less relevant as an output of the Cyclist Priority measure. Rather than focussing on vehicles speeds and modal shifts, the measure focussed more on how different transport mode users interacted to re-designed environments which promoted cycling.

D2 Barriers and drivers

D2.1 Barriers

The main barriers encountered for the development of the measure are:

Preparation phase

- **9. Financial.** The cost of implementing the green wave at all the junctions planned was too high and therefore could not be fully implemented.
- **11. Spatial.** The areas where there was enough space for measures to be implemented were very limited.

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- **9. Financial.** Cycling England (the government organisation providing match-funding for the measure as well as a great deal of motivation and encouragement) was cut due to the financial crisis.

Implementation phase

- **4. Problem Related.** The student designers of the cycle ramps did not have adequate expertise to complete the project.
- **10. Technological.** Trial installations of the cycle ramps were unsatisfactory and more work was needed to resolve technical issues making it problematic to fully evaluate the measure within the time constraints.
- **4. Problem Related.** Problems with suppliers for the cycle ramp materials when dealing with a newly formed company.
- **10. Technological.** Technical issues with the innovative design concept of the cycle ramps, which have lead to a delay in the installation.
- **8. Organisational.** A change in personnel working on the measure has made continuity problematic at times.

Operation phase

- **10. Technological.** The St James's St left turn suffered from initial software problems.

D2.2 Drivers

As for the drivers, the main ones affecting the measure are:

Preparation phase

- **1. Spatial.** Station Street was an unsightly piece of land on a potentially busy route that had been identified as in need of improvement.
- **3. Cultural.** Many cyclists were making the left turn in to St James's Street anyway despite it being illegal.

Implementation phase

- **5. Involvement / Communication.** Local residents and businesses were very keen to engage with the implementation process when they saw the mosaic and seating being installed.

D2.3 Activities

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In order to handle the above referred barriers and/or to make use of the drivers, the following activities were taken during the implementation of the measure:

Implementation phase

- **7. Planning.** Once it became apparent that Green Wave could not be implemented a number of alternatives were identified. These were feasibility tested and the most feasible went forward to implementation.
- **10. Technological.** Brighton & Hove Council structural engineers worked with the students to provide mentoring and expert assistance in development of the cycle ramps design.
- **4. Problem related.** The scope of the measures was amended in line with budget cuts.

Operation phase

- **10. Technological.** Attempts to repair the faulty software on the St James St signals were made internally. However these were not successful and eventually the suppliers were called in to make the repairs.

D3 Description of organisations and risks

D.3.1 Measure partners

Following there is a brief description of all project partners and its level of involvement with the measure:

- **1. City** Sustainable Transport, Brighton and Hove City Council, Project Lead
- **3. Knowledge Institution.** Crime and Disorder reduction partnership, provision and analysis of police accident data
- **3. Knowledge Institution.** University of Brighton. Cycle Ramp Designer

D.3.2 Stakeholders

The main stakeholders involved in the measure are:

Name of organisation/ department	Role in the implementation of the measure
Southern Railway	Cycle ramps would have been installed on Southern Railway's property if the ramps had been developed
Local Cycle Groups	Represented the interests of local cyclists

D4 Recommendations

D.4.1 Recommendations: measure replication

- **Measure Replication:** The principle of creating ‘pocket parks’- high quality but small scale areas of urban realm is one that has been successful and should be replicated elsewhere. The measure could be replicated in cities where there is a desire to create a balanced environment which incorporates cycle desire lines through a public space. The successful design of Station Street has demonstrated that different competing demands can be accommodated in compact spaces; the design has increased the number of cycles which use the cycle track rather than the footways, and the new seating and art installations have improved the general public’s perception of the area too.
- The works at St James Street could be replicated in other cities, the changes are an affordable and effective means of increasing the permeability of junctions for cycles, whilst also promoting cycles use of the carriageway rather than footways. The new road markings and street signage have encouraged more cycles to take a left turn at the junction; the results highlight the importance of providing simple cycle infrastructure can have a significant effect upon cyclists’ behaviour.
- **Positive Lessons:**
 - **Engage with local businesses and residents.** It is essential to engage with local businesses and residents so that they understand the changes being made in their local environment, involving these communities early in the design process also increases the likelihood of them supporting proposals.
 - **Inform users.** All cycle groups in Brighton and Hove were contacted about the new cycle facilities at Station Street and St James Street; this helped raise awareness of the schemes and also increased the likelihood of cycles using the schemes in the future. The cycle groups also appreciated being made aware of the changes.
 - **Make all users of a space feel welcome.** The Station Street pocket park has demonstrated that cycles routes can be incorporated into public spaces, and that this can create a popular, shared environment. One of the main reasons for the scheme’s success is that the design doesn’t give any sense of priority to pedestrians or cycles which means that the space does feel genuinely shared, which in turn decreases the likelihood of friction between different users.
- **Negative lessons:**
 - **Illegal cycling still occurring.** The new road markings and street lighting arrangements have increased cyclists’ use of the carriageway, however a lot of cycles are still using the footways instead.

D.4.2 Recommendations: process (related to barrier-, driver- and action fields)

- The new road markings and street lighting arrangements have increased cyclists' use of the carriageway; however cycles are still using the footways instead. Engaging with cyclists directly on site would be a good means of meeting users and explaining the new system to them, rather than depending just on cycle groups to raise awareness of the facilities.
 - On-going consultation was a feature of the Station Street measure and significantly contributed to its success. Members of the public and business community were asked for feedback throughout the design and build process ensuring that the scheme progressed at all times.
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