



smartertravel >>>

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# Feasibility study for cycling map of Dublin final report

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# 1. Introduction

## 1.1. Background: a helpful map can encourage Dubliners onto their bikes.

1.1.1. Ireland's transport system is dysfunctional, creating excessive pollution and congestion and causing physical inactivity which leads to ill-health and poor life quality. Obesity, diabetes and heart disease –all treatable by moderate daily exercise- absorb millions of euro from the national health budget, while cyclists are discouraged from using the roads by heavy traffic and poor infrastructure.

1.1.2. The goal of Governments' **Smarter Travel** policy is to create a cycling culture in Ireland, such that 160,000 people will be cycling for their daily commute by 2020 (12.1.1).

1.1.3. Objective 6 of the **National Cycle Policy Framework** states at 6.2 'We will support the production of cycling maps both for rural and urban contexts. Such maps can also include useful information such as details of local bicycle shops, guarded bicycle parking ...etc.'

1.1.4. Objective 10 of the **National Cycle Policy Framework** is to improve the image of cycling and promote cycling using "soft interventions", and states at 10.4, 'We will produce useful information for cyclists / potential cyclists. This could include:

- cycling maps;
- online journey planners for the different cities;
- online weather information (linking it with Met sites for example)
- "How not to get your bicycle stolen" information leaflet;
- We will investigate the idea of creating and running a "Cycling Portal". This could be a one-stop-shop for anyone seeking information on cycling. Possible content could include news (about events, new legislation etc.), advice, bicycle registration, discussion boards, facility to enable cyclists to report potholes etc.'

1.1.5. **Action 24 of 'Smarter Travel'** envisages an internet portal which will provide a journey planner for many transport modes, including public ones. To assist inter-modal transport (which would ultimately boost modal share), an online cyclists' map would usefully integrate with this portal. The UK government has begun such a project, 'Transport Direct', in recent years, Transport for London runs a successful example, and the National Transport Authority has begun examining the possibility of provision of a similar planner for Ireland, issuing requests for tenders for consultancy in 2010.

1.1.6. A cycling map can help users plan school, work shopping or social trips.

## 1.2. Scope of this study:

1.2.1. Agreement has been made with the Department of Transport to prepare this feasibility study/business plan for a cyclists' map of Dublin. The map, primarily to be internet-based, would be widely published, and would encourage modal shift to cycling by giving potential cyclists clear information on how to improve the quality of their journeys, take short-cuts and avoid heavily trafficked routes.

1.2.2. The agreement was to examine scope of work, costs, resources and timescale relating to production of such a map, and then to issue a business plan, which would provide groundwork for subsequent map publication.

1.2.3. Notwithstanding the current interest in providing a universal inter-modal planner, this study will not rule out a stand-alone service for cyclists.

1.2.4. It is hoped that this study will lead in coming months to production of a cyclists' map of the city centre area, and research has been focussed towards finding the most practical and cost-effective way to achieve this.

## 2. Executive summary

### 2.1. Precedents:

2.1.1. Many precedents for a cycling map exist, catering for cities across the world. A wide variety of route information is offered to cyclists, such as gradients, traffic volume, carbon footprint compared with motorised transport, pleasant avenues through parkways, etc.

2.1.2. Research of precedents showed that there is a sharp distinction between **journey planners** and static or **printed** maps. **Printed** maps highlight cyclist-specific information with colour, tone or symbols. **Journey planners** use route-planning software in conjunction with digital maps –often supplied by others e.g. Ordnance Survey or Google- to generate directions for a user's journey. The planner website then presents this to users in both list-of-directions and map form. Planners can analyse a huge variety of information, not only official road classification and cycle-infrastructure, but also pavement quality, speed limits, transitible pedestrian ways etc., which promises very accurate route calculation with many options for different types of journey and of cyclist. Motorists' journey planners of this sort have existed for several years, but planners for cyclists are in their infancy, so an approach which allows flexibility in this area in the future appears advisable at this stage.

2.1.3. Internet-based maps can also take the form of static, downloadable maps in PDF or similar format, which are used in broadly the same way as a printed map.

2.1.4. In the UK, several comprehensive maps and planners have been produced and the 'Cheltenham' map format & design is currently the dominant form of **printed map** there. This format codes all roads & streets with a colour representing their cyclability or pleasantness/safety for cycling.

2.1.5. UK **journey planners** include the centralised, systematic and detailed cycling planner created as part of the governmental 'Transport Direct' inter-modal transport portal. However UK Exchequer costs for the cycling planner have been in the region of £2.5m to date, though only a small proportion of the UK has yet been covered, and this order of costs would appear to be unsustainable during the current crisis. The planner **CycleStreets.net** was found to be demonstrably superior to other planners internationally in user-response and flexibility, and, following contacts made in the course of this study, was extended to cover the Dublin area on a trial basis.

2.1.6. **Google** provide journey planners for motorists and pedestrians in the Dublin area. The Google cycling planner, active in the US, is planned to be extended here but offers minimal route quality information.

### 2.2. Functions of the map:

2.2.1. Functions were studied in existing maps, and a survey of potential users was carried out to find out what people want. The fundamental function identified is to guide cyclists along more pleasant routes than would normally be chosen. Surveyed users emphasised road surface quality, presence of cycle or bus lanes, and route directness as the top priorities when planning a journey. Other functions requested were locations of bike shops and short-cuts through non-vehicular routes (albeit where dismount may be required).

2.2.2. The UK Transport Research Laboratories report, TRL 490, '*Cyclists' assessments of road and traffic conditions: the development of a cyclability index*' provided objective research into user requirements (4.1.4 below and 12.1.5).

2.2.3. Because the illustration of cycling quality requires quite a large-scale map, ten maps of convenient A2 size, in five reversible publications, are proposed to

cover the major residential areas of Dublin. This study envisages production of the city-centre map as the first/pilot map.

### 2.3. Survey and evaluation of routes for cyclists:

2.3.1. The priorities of cyclists in choosing routes require that a specific survey of the city be carried out, to describe traffic volume, road surface, width of traffic lanes, quality of existing cycling infrastructure etc.

2.3.2. Broadly, two systems are in use in the UK- Cycling England/Cycle Network Model (CNM), and Cycle Nation or CSNA. The former is often used to provide a detailed, objective survey of limited, selected routes, based on measured parameters such as width of cycle lane, heaviness of traffic, and is imported to the UK's Ordnance Survey database of transport information. The latter is a more subjective survey approach relying on assessment of street conditions by a team of experienced cyclists, classifying all streets/roads into five categories. US maps use an even simpler method showing only a selection of on-and off-road routes.

2.3.3. Given the close grain of Dublin's Medieval and Victorian street pattern, and the inter-connectivity of many of the suburbs and centres, the study team concluded that it would provide a sub-standard quality of service to only describe a limited selection of routes, so the Cycle Nation method was found to be more suitable than the CNM one.

### 2.4. Design and production- paper map; online planner:

2.4.1. Three stages are required for the **paper map**:

- Acquisition and editing of background mapping;
- Surveying streets & compiling survey –the study team concluded that this can readily be done by a small team of suitably-trained local surveyors;
- Design, cartography; production.

2.4.2. Biannual revisions are deemed reasonable, and the Metro and Dart Underground construction works will require some additional revision.

2.4.3. Distribution must be carefully organised to ensure wide up-take; distribution costs are a large proportion of the overall budget.

2.4.4. For the **online journey planner**, the study team found that the most feasible procurement method would be to check, edit and adopt the existing CycleStreets.net planner. This will allow quick use of any survey being undertaken for the printed map, and flexibility in future amendment. This is the method followed in several UK local authority areas. Adoption would entail-

- Establishment of planner identity; name and branding; negotiation and contracting of scope of service with producers;
- Checking, (during survey for printed map) of data existing in OpenStreetMap, and uploading of any alterations;
- Ongoing monitoring of performance.

2.4.5. Work scope and timescales for the above are presented in section 6 below; estimated costs in appendix 17.

2.5. **Conclusions:** A map can be readily produced and would be financially viable, particularly a printed one.

2.6. A core motivating person or team is needed, to overcome initial hurdles, secure advertising/sponsorship, and generally motivate the project.

- 2.7. Good graphic design is essential to maximise readership, while a team of experienced cyclists is also needed to carry out the necessary surveys.
- 2.8. Two elements of interacting control are recommended: To earn the confidence of cyclists, editorial control by an independent cycling group is critical, while oversight by national or local government would allow official promotion of the map to encourage modal shift. Such oversight might take the form of funding, made conditional on the assurance of quality and reliability,

### 3. What precedents exist for maps specific to cyclists?

3.1.1. Contacts were made to Irish, UK and European cycling organisations to broadly survey what is on offer. An extensive web survey of precedents was carried out, and paper maps from a wide range of countries were sourced and reviewed.

3.1.2. Dublin is already served, if not to international best-practice standards, by online maps and journey planners.

3.1.3. The range of function of both printed and internet maps is broad, with a marked difference in function between hard and soft maps. Particularly in the UK, voluntary and official bodies have produced a wide variety of map publications.

3.1.4. Online maps or journey planners appear to be at an early stage of development, with no international consensus yet developed on requisite functions, and varied opinions from cyclists' groups on the quality of service provided by planners currently running. Online maps were accessed in April 2010 and summarily checked in October 2010. URL addresses are quoted in text titles.

3.1.5. Shown below is a selection of the more useful or typical types of precedent available, grouped into Irish, UK, Europe and beyond, with internet-based and printed maps listed together.

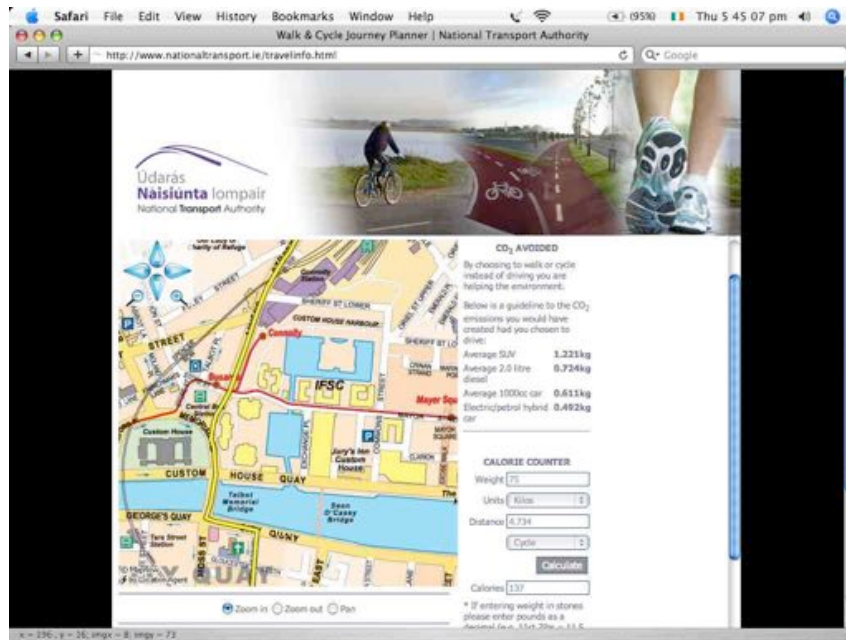
3.1.6. Illustrations have been included where the graphic style or output is of particular interest.

#### 3.2. Precedents, Ireland:

3.2.1. **National Transport Authority Travel Info Maps and Journey Planner:**  
<http://www.nationaltransport.ie/travelinfo.html>

- The NTA Journey Planner (originated in the Dublin Transport Office) has been in existence for some years. It is proposed to be brought under the aegis of the Transport for Dublin office of the NTA.
- Offers full route-finding capability, enhanced with relaxation for 'left turn only' prohibitions for cyclists.
- Both calorie counter and 'CO<sub>2</sub> avoided' features encourage users to choose cycling & walking instead of the car.
- No gradient or contour information.
- No route quality information provided to user; no choice of route offered.
- On testing, it appears that journey plans for cyclists fail to offer 'dismount' options at pedestrian facilities, such as pedestrian bridges.





- Screen shot of NTA Walk & Cycle Journey Planner (above)

### 3.2.2. DTO/NTA Cycle Track & Buslane Survey 2007

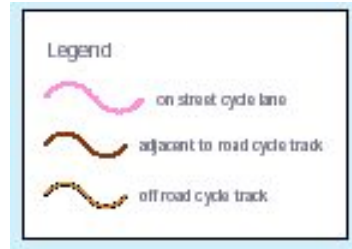
<http://www.dublincitycycling.ie/cycling-facilities/cycle-lanes-and-facilities>

<http://137.191.228.107/ctbl/>

- A set of static, downloadable maps showing situation existing in 2007.
- Useful information for cyclists planning a local journey presented in an attractive and legible format. Useful survey base information for a cyclists' map.
- Generally acknowledged poor quality of some existing cycle facilities (NCPF Objective 2), which can cause a loss of priority to cyclists, and occasionally puts cyclists into conflict with motor traffic, undermines the trustworthiness of routes selected.
- Emphasis on cycle-specific infrastructure can also undermine the flexibility found by cyclists using routes with no specific infrastructure, but lightly-trafficked streets/roads.
- PDF files.
- Information is not geo-located so cannot be readily transferred to a journey planner or geographic software.
- 1:25,000 scale
- 10 no. maps cover greater Dublin conurbation in Malahide-Lucan-Bray triangle.
- Pedestrian paths are shown.
- Low resolution precludes precisely planning journeys through junctions etc.
- Clear graphics setting out different types of cycle track and lane based on GPS survey.
- Validity of information continues to depreciate; cost of survey estimated between €50 and €100,000.
- No information provided on the quality of a route.
- Map extract (below):



- DTO map legend (below)



3.2.3. **Limerick** Cycle Map, produced by Limerick Cycling Campaign, with drafting by Limerick City Council:



- A map of the city showing a selection of routes with four classifications of route indicated by colour.
- Dead-end or smaller residential streets omitted from classification for clarity and efficiency.
- Simple system of classification of route; legend below-



3.2.4. Open Route Service:

- <http://www.openrouteservice.org/> University of Heidelberg but covering Dublin.
- An online route finding service, based on topographical data from OpenStreetMap (**Open Street Map (OSM)** is an open-source internet-based map originating in University College London, is updated on a volunteer basis, and is used as a base for many journey planners. As 'open-source' data, OSM maps can be used and reproduced by individuals, private entities, or public bodies once the approved acknowledgement of copyright is shown with any presentation of OSM information)

- User input (destination; origin) requested on single page via search facility for streets.
- Screen shot of OpenRouteService (below)- **note-**
  - recent update- recent rail and bridge infrastructure represented;
  - use of pedestrian link (south of bridge in illustration below) to shorten journey;
  - representation of cycle lanes and pedestrian paths from volunteer survey-

**OpenRouteService.org**  
 MAP/ROUTING HELP WIKI INFO&CONTACT

Routing with user-generated, collaboratively collected free geodata. This service is based on open standards by the Open Geospatial Consortium (OGC). Thanks to OpenStreetMap.org - please donate your geographic data to openstreetmap.org!

OSM-Data for Routing: 17.02.10  
 OSM-Data for Downloading: 17.02.10

Search:  Search

Routing: Address-Search Where am I?

Start: Bary Road Set  
 End: Railway Cottages dublin Set

add Via-point  
 Calculate  
 safest track

POI Search for Points of Interest - please choose -

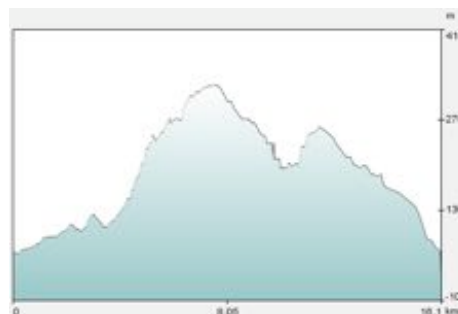
Calculates reachable regions in given time:  
[Accessibility Analysis](#)

Display your GPX track: [upload](#)

Extras/Download: [Route profile](#) [Route Link](#) [GPX](#) [XML](#)

RouteSummary (Print)  
 Total-Time: ~ 16 minute(s)  
 Total-Distance: ~ 3.8 km

Nr.	Route-Instruction	Distance
1	Start (East) on Bary Road	0.1 km
2	Turn right on East Street	0.8 km

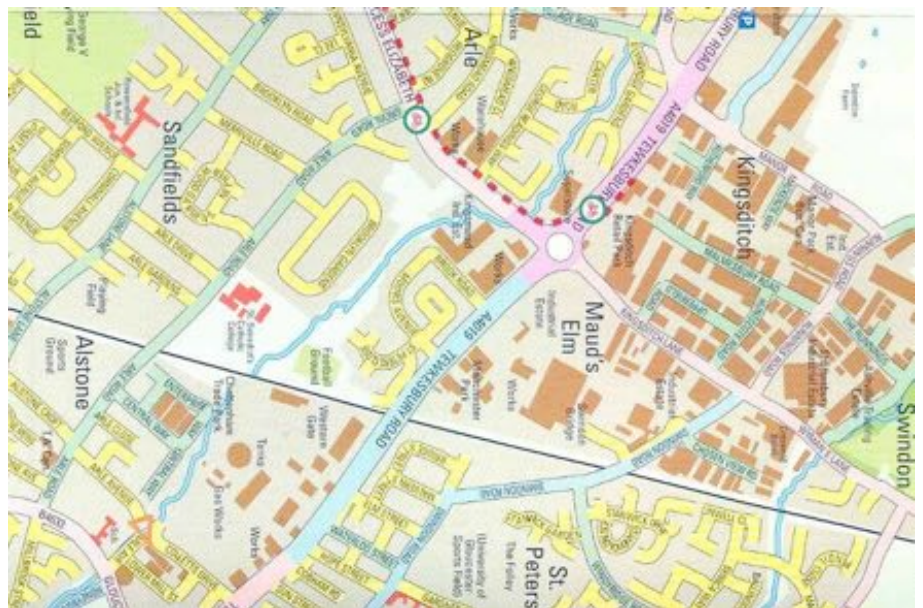


- Cross section of a journey from Dublin to Enniskerry from OpenRouteService (above).

### 3.3. Precedents, UK

#### 3.3.1. Cheltenham Cycle Map:

- One of the first cycle-specific maps produced, published by Cheltenham Cycle Campaign. Town population ~101,000.
- Authored by John Franklin, writer of 'Cyclecraft', now the UK industry standard training manual for safe cycling.
- A printed map; scale 1:15,000 (larger scale town-centre inset).
- Every road or street has been colour-coded; the legend showing five increasing levels of experience required to negotiate roads. Necessity of training for safe cycling is emphasised, as is the usefulness of map as introductory tool for new cyclists.
- Training is related to UK 'Bikeability' standards, which in turn relate to 'Cyclecraft'.
- Other features relevant to cycling are highlighted: Cycle shops; signalled (Toucan) crossings; cycle parking; cycle contraflow provisions; exemptions to traffic restrictions; on-footpath cycle lanes; off-road routes through open spaces.
- Links between on-road and off-road tracks are indicated
- Folded size is DL, allowing posting in standard envelope and storage in standard A4 folders etc. Also handy for pocket use during a cycling journey.
- Funded with contributions from both commercial and public bodies.
- Sold for £1.00 in printed form.
- Cheltenham map extract and legend (below)





- See also Appendix 16 below

### 3.3.2. Warrington Cycle Map:

- Town population ~81,000
- Printed map.
- Colour coding showing 5 levels, as for Cheltenham.
- This map is one of over a dozen UK maps emulating the Cheltenham format.

### 3.3.3. Chorlywood Cycle Skills Network Audit (CSNA)

- Town population 7,000
- Printed map.
- Roads, tracks and junctions evaluated separately. Specific reference to British CSNA system (see under 'evaluation', below)

### 3.3.4. CycleStreets <http://www.cyclestreets.net/>

- Online journey planner: written or mouse-click start & destination points can be input
- Based on OSM (OpenStreetMap; see 3.2.4 above)
- Under construction for entire UK area; England substantially complete; Dublin added following contacts made in the course of this study.
- Specifically designed for cyclists
- Large database of photos of routes
- Base map regularly updated in real time, depending on volunteer input
- User inputs journey departure & destination points on home page; is offered results on same page.
- Allows user to choose 'fastest, balanced or quietest' route, which is then displayed on the map in red, orange or green outline respectively;
- Sustrans national routes featured on all output maps;
- Prolific output for user-
  - Overall map of route;
  - Alternative routes traced in red, orange and green;

- Listed directions with interval distances; type of road/track etc.;
  - Local maps at intervals along journey; these maps enlargeable with one click;
  - Graphic gradient information (coloured cross-sectional diagram);
  - Graphic and numeric indicator of quality of route, from 'quiet' to 'hostile';
  - Link to photographs from contributors' databases;
  - Link to Google 'street view' for each node of route;
  - Number of traffic light-controlled junctions;
  - Dismount-required sections & length as percentage of journey.
- CycleStreets map screenshot (below)



### Routes for Link with Tooting Bec Road, A214 to Haversham Close

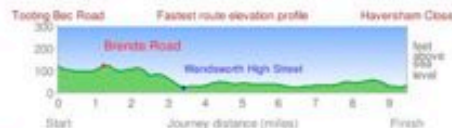
Journey no. #108037

If you decide to follow the suggested journey below please take extra care on unfamiliar sections - proceed at your own risk as route quality cannot be guaranteed.

#### Fastest route

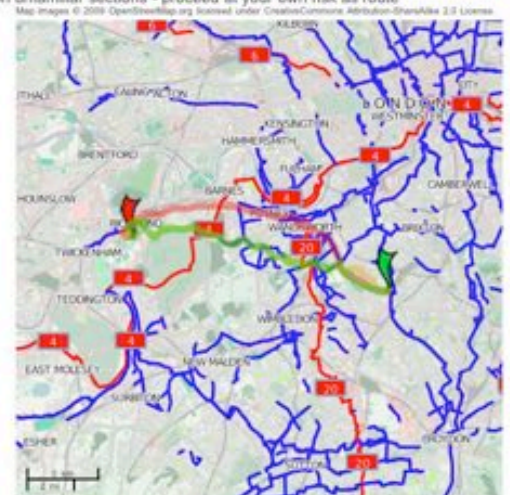
(With turn-by-turn details below)

- 53 minutes, 9½ miles
- Quietness: 32 % Hostile
- Traffic signals: 2 at junctions
- Wiggliness: 13%.
- Leaving 4.46pm, arriving 5.40pm.



⚠ There are some very busy sections on this route.

Includes in listing:  Show  Traffic signals  Junctions



Time (mm:ss)	Distance (miles)	View	Road/street name (or manoeuvre)	Surface	Local map (approx. every 0.5 miles)
0:10	0		Link with Tooting Bec Road, A214	Service Road	
4:28	0.9		Tooting Bec Road, A214	Busy and fast road	

#### 3.3.5. Cycling England 'Transport Direct' journey planner:

<http://www.transportdirect.info/web2/journeyplanning/FindCycleInput.aspx>

- Transport Direct is a UK government body with a remit to provide information on door-to-door transport via a website portal. It aims to combine all modes of transport in its journey planners. Cycle journey planner is one part of this service.
- Cycling England in partnership with Transport Direct has begun a programme to collect national cycling data; Cycling England is offering local authorities funding to cover 50% of the cost of collecting and processing data for inclusion in the Cycle Journey Planner. Data is to be

collected to the standard described below. Private surveyors tender for and carry out the surveys, to national specification.

- Maps based on UK Ordnance Survey data, with reliance on OS road & transport information. Survey information gathered for the Planner is to be re-combined with OS 'ITN' (road network information) data and made available with OS mapping.
- Under construction at time of writing. 29 towns/districts listed as complete (a small proportion of UK).
- User inputs journey nodes over a series of web pages, defining type of node and selecting from search results. Alteration of nodes or preferences requires user to move to previous page.
- User chooses 'quietest, quickest or most recreational' route
- Journey directions are presented initially as list, with no map, accompanied by gradient diagram.
- GPX file of route (for downloading to GPS device) is offered to user.
- Link to 'Bikeability' training presented with results.
- CO<sub>2</sub> calculator offered; graphic output comparing CO<sub>2</sub> emitted as a result of user's journey by cycle, train, bus, etc.
- User interface is text-heavy, with sparse graphics & functional appearance (below). Map displayed only on request;
- Cost to UK government of planning, development & management of the planner, calculated in April 2010, over £2m (see Freedom of Information Request Response appended below).

The screenshot displays the 'Connecting People to Places' website interface. At the top, there is a navigation menu with options like 'Homepage', 'Plan a journey', 'Find a place', 'Live travel', 'Tips and tools', and 'Login / Register'. The main content area shows a search result for a journey from Kings College, Cambridge, CB2 1ST to 134 Victoria Road, Cambridge, CB4 3DZ. The journey is for Tuesday, 02 March 2010, leaving after 13:15. The duration is 11 minutes for 1.5 miles. Below this, there are tabs for 'Details', 'Summary', 'Maps', and 'Check CO2'. The 'Details: Outward journey' section provides a 'Summary of directions' with a total distance of 1.5 miles and a total duration of 0 hours and 11 minutes. The directions are listed in a table with columns for 'Trip miles', 'Directions', and 'Time'. The directions include starting from Kings College, Cambridge, CB2 1ST, following local roads, and turning onto Queen's Road, Madingley Road, Lady Margaret Road, Haymarket Road, Pound Hill, St Peter's Street, and Castle Row. A 'Gradient Profile' graph shows the elevation of the route, with a highest point of 21m and a total climb of 13m. The page also features a 'GPS Tracking' section and a 'Notes' section with a return journey option.

### 3.3.6. Sustrans online map

<http://www.sustrans.org.uk/map?key=London&type=RG>

- Interactive but static online maps showing National Cycle Network Routes indicated and linked to Sustrans descriptions.
- Train stations, local points of interest indicated.

- Search available for address, district etc. to promote use of Network.
- Printable for use on a journey.

3.3.7. **OpenCycleMap:** <http://www.opencyclemap.org/>

- Online interactive map by non-profit private authors.
- Consists of an overlay on the Open Street Map background, showing cyclist-related information:
- Shows cycle tracks and lanes; cycle parking, National Cycle Network routes; contours and hill shading.
- No journey planner application.

3.3.8. **CycleGM** Greater Manchester online cycle map-  
[http://cyclegm.org/maps\\_guides/maps\\_online.aspx#](http://cyclegm.org/maps_guides/maps_online.aspx#)

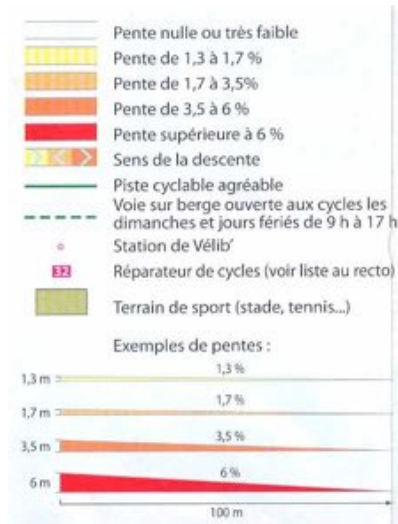
- Interactive map showing cycle routes and facilities overlaid on OS map.
- No journey planner application; website provides link to Transport Direct planner service;
- Offers little information to user not available from readily-available printed OS maps of 1:50,000 scale;
- Interface graphic design unattractive;
- Web response slow



### 3.4. Precedents, Europe

#### 3.4.1. Vélo Pente:

- Printed map of Paris: Gradient and indication of 'agreeable route' only.
- Reverse of map shows contours and hill shading of Paris
- Apart from gradient and information inherent in base map, no information provided on quality of routes



- Scale 1:24,000 approx.
- Given the real safety risks to cyclists from the heavy traffic of Paris it is difficult to understand why priority is given in this map to gradient, and the study team would feel that the showing of gradient information would be useful but secondary on an Irish map.

#### 3.4.2. Berlin by Bike <http://www.bbbike.org/>

- Online journey planner, originating in Germany, now encompassing many countries.
- Bike shops and cycle parking information provided.
- User input requested over sequence of several pages.
- Graphic design not developed; interface is unadorned and simple in operation
- First page requests origin & destination points as street name; entry of data enables search of suggested street results

- Second page requests origin & destination points in form of street junctions; allows input of preferences in terms of journey- street category, road surface, speed etc.
- Output given in list/directions and map form, with option to export both in PDF and GPX forms.
- Results page allows adjustment/reset of origin, destination, and preferences.
- Preferences include vehicle type i.e. solo bicycle, trailer, child seat choices.
- Results page displays current weather information- time & date; wind direction; wind speed in km/h; wind description. (no precipitation information observed) with link to meteorological bureau.
- Scale of output map is too small to indicate road configuration or junction type.
- Satellite view function provided.



- Map output extract –route shown dotted

BBBike @ Berlin

Route from Potsdamer Platz to Jüdenstr. (Mittag)

Length: 2.88 km  
 Driving time: 0:19h (at 10 km/h), 0:13h (at 15 km/h),  
 0:11h (at 20 km/h), 0:09h (at 25 km/h)  
 10 traffic lights on course (already calculated into driving time).

Hop	Direction	Street	Total	Remarks
	towards S	Eldertstr.		Berliner Mauernweg, an Potsdamer Platz ausgeschrieben
after 0.05 km left (100°)		Lützow Pl.	0.1 km	
after 0.19 km		Lützow Str.	0.2 km	
after 1.49 km		Gethsewendstr.	1.7 km	
after 0.43 km		Mühlendamm	2.2 km	
after 0.39 km		Grunenstr.	2.6 km	
after 0.12 km left (90°)		Jüdenstr.	2.7 km	
after 0.16 km arrived		Jüdenstr. (Mittag)	2.8 km	

Map size: 400x300, 640x480, 800x600, 1024x768, 1920x1200, 3850x2000 (for PDF)

Details:  streets,  Bikes,  underground,  inland waters,  areas,  traffic lights,  route details of title,  everything

Settings:

Preferred speed: 15 km/h  
 Preferred street category: no preference  
 Road surface: avoid cobble streets  
 Avoid traffic lights:   
 Avoid unlit streets:   
 Green ways: arrives earlier  
 On the way with: arrives earlier

Atlixle Wetterdaten (2.3.2016, 20:30)  
 Temperatur: 1.3 °C  
 Windrichtung: W  
 Windgeschwindigkeit: 32 km/h (Heiße Brise)

home

http://www.bbbike.org/cgi-bin/MapMaker.cgi?routeName=Produktion+Potsdamer+Platz&lat=52.5144&lon=13.4114&start=0&end=2&vehicle=green&options=0&language=de

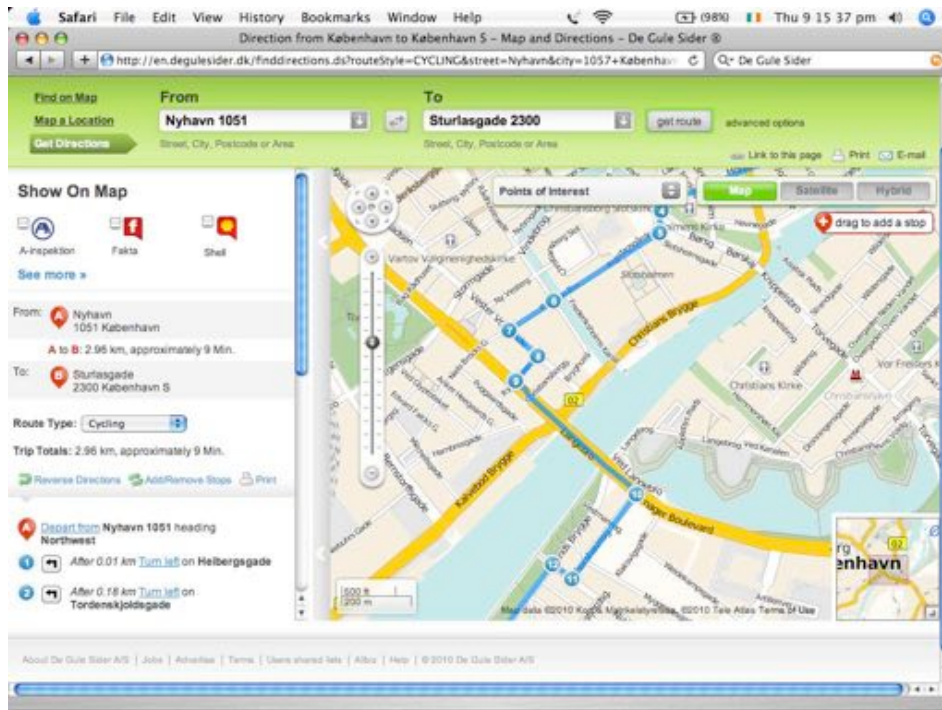
- (Above) BBBike output

### 3.4.3. Carte Vélo 2009, Lausanne

- Printed map similar to Vélo Pente, above.

### 3.4.4. De Gule Sider

- Journey planner linked to Danish 'Yellow Pages' (below)



- Offers cyclist version of motorist's journey planner;
- Route quality information sparse.

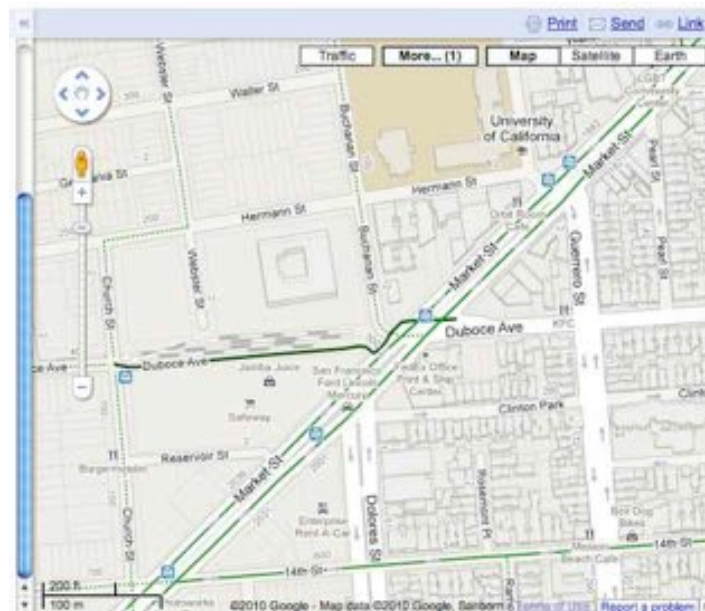
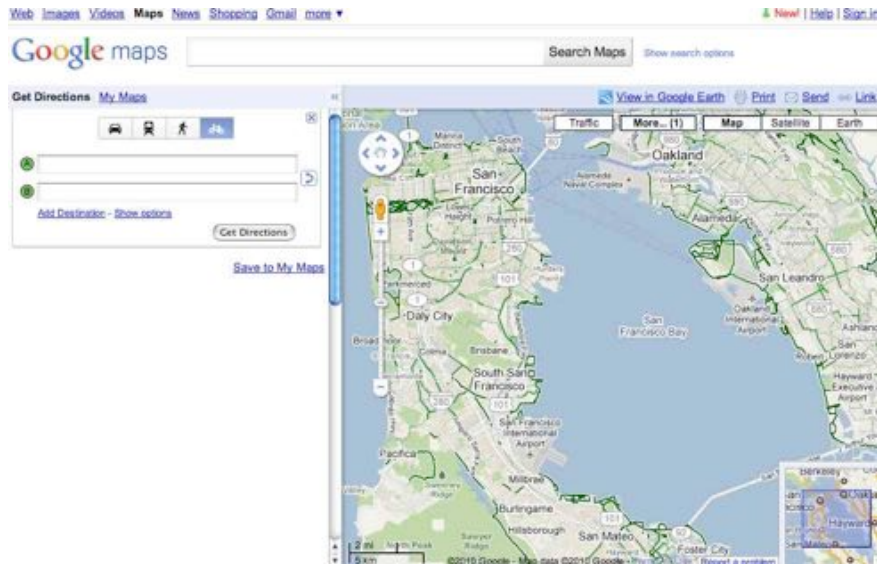
### 3.5. Precedents, beyond Europe

3.5.1. The **Fairfax County Bicycle Map** has been added to the above. Fairfax County is a commuter suburb of Washington DC in the US. Below is the legend page of this map. It has been included as an alternative to the UK standards for showing cycle route quality. Only one colour is used – red, with dashed lines for ‘less preferred’ links, solid for preferred. The simplicity and easy legibility of this map is considered worth noting, and compares well with the less graphic colour choice of the Warrington, Cheltenham etc. maps:



3.5.2. Likewise, the **Google Bicycling Layer**:

- Provides very simple cycle route information using solid and dashed lines to indicate quality: A darker green line indicates bike trails where there are no motor vehicles; a lighter green line indicates streets with bike lanes; a green and white dotted line indicates streets recommended for cyclists, but without a bike lane.
- Google Maps provide a route-planner catering for motorists and pedestrians, which is commonly used by Dublin cyclists. However the ‘bicycling’ layer is not available here. Requests for information on whether the bicycling layer is planned to be provided for Dublin, and how assessment of routes is made, have been sent to Google; a response is still awaited at the time of completion of this report.



### 3.5.3. Christchurch Cycle Guide (New Zealand)

- Printed map only;
- Highlights 12 'key routes' leading radially to city centre from suburbs.
- Shows cycle lane/path/track/mtb track; bmx track; bike shops.
- Front shows 1:35,000 map of Christchurch and environs, with legend.
- Rear contains cycling maintenance, parking and safety tips, 1:12,000 map of city centre, and further maps of outlying areas. Rear contains written information describing and giving guidance on the 12 routes.

### 3.5.4. New York NYC Bike Maps <http://www.nycbikemaps.com/maps/manhattan-bike-map/>

- These (one for each borough) show bike paths, bike lanes, nominated bike routes, on-road routes
- Based on Google maps, which cater principally for motor vehicle use.

### 3.5.5. San Francisco Bike Map & Walking Guide

- Printed/downloadable PDF map.
- Contours mapped as overlay in light colour.
- Gradient indicated by colour on each road. Four levels of steepness.

- Official SF Bike Routes mapped.
- Legend specifies bike path, bike lane, wide curb lane bike route, bike route, hiking/walking trails, and stairways.

3.5.6. **San Francisco** Route Planner: <http://amarpai.com/bikemap/>

- Privately produced route planner based on (copyright-free) US survey info.
- Very clear, unfussy output with basic information on gradient, road type, distance
- No journey time estimate
- Based on Google maps, which cater principally for motor vehicle use.

San Francisco bike route planner 2010-1-7 10:12 pm

Starting address: 1000 Van Ness  
 Ending address: 901 Haight street  
 Steepest climb (grade): .10  
 Route preference: Balanced

[Find route](#)  
[FAQ](#) | [Source](#) | [Known issues](#) | [Mailing list](#)

Directions	Distance	Steepest climb	Street type
1. START: 1000 Van Ness			
2. Take VAN NESS AVE to ELLIS ST.	355 feet	0.04	road
3. Take ELLIS ST to GOUGH ST.	0.2 miles	0.06	road
4. Take GOUGH ST to FULTON ST.	0.3 miles	0.00	road
5. Take FULTON ST to SCOTT ST.	0.8 miles	0.07	road
6. Take SCOTT ST to WALLER ST.	0.4 miles	0.03	wide curb lane
7. Take WALLER ST to DIVISADERO ST.	0.1 miles	0.10	road
8. Take DIVISADERO ST to END.	289 feet	0.00	road
9. END: 901 Haight street	Total: 2.1 miles		<a href="#">Link to directions</a>

Found route in : 0.22 seconds

<http://amarpai.com/bikemap/>

Page 1 of 1

- (Above) San Francisco Route Planner –sample output page.

### 3.6. Analysis of precedents-

3.6.1. Table of principal functions offered by higher-quality precedents:

	Function	Route planner (Distance, time)	Choice of route quality	Quality of all routes	Information updated frequently	Safety tips	Security tips	Points of interest	Bike shops, parking, rental	Link with public transport	Route photos, street view photos	Carbon calculator
Country	Map name											
IRL	NTA Journey Planner	+				+		+		+		+
	DTO Cycle Track Survey											
	Open Route Service	+	+		+			+	+	+		
	Berlin by Bike	+	+		+			+	+	+	+	
UK	Cheltenham Cycle Map		+	+		+	+	+	+	+		
	Warrington Cycle Map		+	+		+	+	+				
	Chorlywood CSNA		+	+				+	+			
	<b>Cyclestreets.net</b>	+	+	+	+	+		+	+		+	
	Cycling England Transport Direct	+	+	+		+	+	+		+		+
	Sustrans map							+	+			
	OpenCycleMap		+		+			+	+			
	Greater Manchester Cycle Map							+	+			
F	VéloPente		+	+				+	+			
NZ	Christchurch City Cycle Guide		+									
USA	NYC Bike Maps	+						+	+	+		
	SF Bike Map & Walking Guide		+					+	+	+		
	San Francisco Route Planner	+	+		+			+	+	+	+	
	Fairfax County Bicycle Map		+			+			+	+		
	<b>Google Bicycling Layer</b>	+	+					+	+	+	+	

### 3.7. Commentary:

3.7.1. Online '**journey planners**': Generally, these planners ask the user for start and destination points of a journey, and then display on screen an appropriate route, in both a list of directions and map. Users can, in many cases, state

preferences for the quality of route –speed vs. quietness, etc. The better planners have some indicator/commentary of quality, in one or two words, for each stage of a user's journey. Software for calculating routes is commercially available. The appropriateness/directness/quality of the routes given relies on the relationship between **quality** of this software and the **accuracy** of the underlying map data. Map data can be available from official Ordnance Survey sources, commercial sources such as Google or Yahoo, or open-source hosts such as OpenStreetMap.

- The advantage of such planners in giving a plethora of journey-specific information on distance, time, gradient, and safety –as well as possibility of incorporating live information on traffic, weather, etc.- is significant.
- Information on hilliness of a route, such as the cross-section diagram of a route given by the better online planners, can be extremely useful for cyclists.
- Action 24 of the Smarter Travel policy document proposes that a 'travel information portal' be created for public transport. Ideally an online cycling map would be part of such a portal. The UK's **Transport Direct** provides a suitable template, giving timetable & mapping information for buses, trains and air travel etc., and goes further to host a cycling journey planner. This represents an ideal situation for the Irish context: a centralised portal for the greatest variety of transport modes, which can direct users to good safe cycling routes. This would squarely support modal shift towards more sustainable transport. However, difficulties have been reported with funding the cycling section of Transport Direct (see 12.1.1 below), and the assessment criteria for surveying routes on-street can be seen to be complex and labour-intensive (see 5.2.6 below) Thus, as this study is primarily concerned with the service for cyclists, the option of creating a **stand-alone journey planner** for cyclists, as well as one linked with other modes, will not be ruled out.
- 'CycleStreets' provides the fullest service observed in this study.

### 3.7.2. **Printed maps** (On paper, or downloadable from internet e.g. in PDF format):

- These tend to either promote pre-ordained or official routes (London, Manchester maps), or provide basic information on quality of route for all streets & roads (Cheltenham). Gradient and 'level of hostility' of road are the primary issues, or both, and brief written safety & tourist information is often included.
- The latter, Cheltenham, type of map allow users to see the actual quality of particular roads, and then select a preferred route based on their experience & confidence as cyclists. This is the core goal of the 'bikeability' map study. This ability is limited in most of the online journey planners, which dictate complete journey routes. Printed maps have other advantages, including-
  - Convenience of being easily packed on a bike & used for many journeys, without having to print /access online information.
  - Possible distribution at tourist sites
  - Use as poster or street-displayed map
  - Possible distribution at Dublinbikes stations.
  - Can show useful secondary information such as safety tips, security tips, tourist information, that would not necessarily be seen by an internet user, often on the back of the sheet.
- Scale of printed maps varies from 1:24,000 to 1:15,000. At the larger end of this scale, it is hard to read quality on to smaller streets, and names of smaller streets cannot be included for lack of space. Smaller streets are often crucial for a use to find a quiet route through an urban area, so it appears that 1:15,000 would be a good target scale for the printed map.

### 3.7.3. **Conclusions:**



- A fundamental goal of cycling maps is to find routes with the least heavy traffic. This can direct cyclists to pedestrian facilities, or pedestrian-only shortcuts such as a footbridge; dismounting is necessary but this may be worthwhile to avoid the danger/perceived danger of heavy traffic. Additionally, cyclists have particular requirements, not shared by motor or pedestrian travellers, regarding cycling-specific infrastructure and road surfaces. This level of detail is of a different order from that provided by motorists' or pedestrians' maps, and requires very specific, detailed survey information.
- In the UK, cycling maps were initially created by campaigning organisations, and produced with sponsorship by local authorities and health-promotion bodies. The concept of a cycling map has been adopted by local authorities in the UK and is now part of national transport policies there.
- Few cycling-specific internet journey planners have been in use for over 5 years.
- Journey planners exist for Dublin and are relatively complete & effective, though not up to the standard available internationally.
- The cyclist-specific **survey information** necessary for a map or journey planner to accurately cover Dublin does not yet exist.
- '**Open Street Map (OSM)**', an open-source internet-based map (covering most countries) is updated on a volunteer basis, and is used as a base for journey planners such as '**Cyclestreets**' in the UK. As 'open-source' data, OSM maps can be used and reproduced by individuals, private entities, or public bodies once the approved acknowledgement of copyright is shown with any presentation of OSM information.
- Of all precedent maps & journey planners studied, the **Cyclestreets** journey planner provides the widest range of functions, with the most clear & simple interface for users. Particular features include, for example, the provision in route directions given to a user of exact distances where the cyclist might dismount & walk, where the optimal route chosen might pass along pedestrian facilities. Cyclestreets is a not-for-profit organisation (CycleStreets Ltd, company no. 06948959; Company office: CycleStreets Ltd., 80b York Street, Cambridge, CB1 2PY) and originated from Cambridge Cycling Campaign. The company has expanded to provide services for local authorities in the UK, generating official Council mapping services including the 'Cycling Sorted' feedback service run by Cambridgeshire County Council. Enquiries have been made with its producers to ascertain feasibility of its extension to Dublin, and this extension has been provided on a trial or 'beta' basis.
- Overlap between **online** and **printed** maps is less than had been anticipated. Journey planners describe a specific route for a user. A printed map can be used for various different journeys within the mapped area, thus allowing for spontaneous re-routing & varying of route. Thus production of both online and printed maps would be worthwhile.
- Good precedents for design of printed map exist but an international standard has yet to emerge. A scale of colour, tone or line type will be used to indicate road quality. Google and Fairfax favour simplicity and clarity over Cycle Nation- or Cheltenham-type subtlety. A combination/compromise design may be possible. The Cheltenham style is the dominant one in the UK.
- Printed maps have generally been published by local authorities, and have been used as a promotional tool for modal shift to cycling by distribution to cycle shops, schools, libraries, etc.

## 4. What functions should be provided by a Dublin map?

4.1.1. The core function is to allow users to find a high-quality cycling route for their journey. This requires the production and clear presentation of a **layer of information** describing the quality of a cyclist's experience for each part of a journey, and including information on short-cuts, bike shops, bike parking etc.

4.1.2. Routes must avoid heavy traffic and favour higher amenity links e.g. canal-side or off-road routes. This must be modulated with ability to emphasise directness of route when required.

4.1.3. Better maps/planners provide a complete picture of the journey- how many buses & trucks will pass threateningly close? How bumpy will it be? If I wait until the wind changes direction, how many minutes will I save? Will this lead me into isolated areas with no street lights? etc.

4.1.4. The main functions offered in precedents studied are shown in table 0 above).

### 4.2. Survey of users:

4.2.1. To help choose useful functions, a concise, targeted survey of cyclists was undertaken as part of this study. The more common functions of the precedent maps were used as a starting point for the survey. A second starting point was the study by **Transport Research Laboratories**, 'Cyclists' assessments of road and traffic conditions: the development of a cyclability index' (2001), which studies and records cyclists' perceptions of route quality (12.1.16 below). This study involved 51 subjects riding an objectively surveyed route on a bicycle that was equipped with a video camera and a bicycle computer. Subjective and objective comparisons were made, and it was shown that the subjective assessment of cyclability can be (partly) predicted from measurable traffic and carriageway conditions. In particular, vehicle speeds, lane widths, frequency of side turnings and gradient.

4.2.2. The full survey results are shown in Appendix 8.6 below.

4.2.3. **Methodology:** Initial surveys were conducted in the street, around St Stephen's Green in Dublin city centre, early afternoon on the 16<sup>th</sup> of July 2010. Surveyors interviewed randomly selected pedestrians, cyclists and couriers.

4.2.4. The majority of the surveys were done online using eSurveysPro.com online services and were conducted between August 1<sup>st</sup> and September 9<sup>th</sup> 2010. For simplicity one of the street surveys was entered in eSurveysPro.com afterward as an online survey, while the results of the remaining seven street surveys have been added manually to the results of the online survey in the Word document called "survey analysis".

4.2.5. Percentages have been rounded to the nearest unit, e.g. 3.67% = 4% and 3.34% = 3%

4.2.6. Survey respondent profile:

- 150 persons took the online survey and 8 took the street survey. 50% are between the age of 31 and 45 years old. A large majority of the respondents are males. Almost all respondents are employed full-time.
- The large majority, 76%, lives 0.5 to 10km away from work. Near half of the respondents' household, 42%, own 1 car. About every respondent, 97%, owns a bicycle and the large majority, 73%, does not have a Dublin Bike card. The large majority, 82%, normally cycles to work and some use a mixture of other modes of transportation such as car as driver, 20% or they walk, 17%, or take the bus, 13%. The second adult in

the household tend to drive to work more, 39%, but a good number, 32%, normally cycles to work.

- The majority of respondents, 69%, cycle daily and mainly during the week. We learn that respondents use their bicycle not only to go to work, 81% but for general purposes as well. 58% of respondents cycle between 10 and more than 20 km at the furthest distance.

#### 4.2.7. Survey respondents & choice of cycling route

- In question 16, respondents were given 11 different cycle route features to choose from and rate from 1 to 10, 10 being very important and 1 being not important at all. Out of 11 different given road characteristics, 78% of respondents answered that road surface condition was their number one priority when choosing their cycling route. 75% considers the provision of cycle/bus lane the second most important road characteristic when choosing their cycling route. 73% give the directness of the cycling route as the 3<sup>rd</sup> most important characteristic.
- A small majority, 55% responded that when choosing a cycle route, the presence of lots of complex/ intimidating junctions does affect their decision, and it is noteworthy to mention that for 21% of respondents it is not important at all. When it comes to choosing a cycle route according to surface gradient, 57% ranked it number 10 out of 11 important items they look for. 61% of respondents said that the fact that there are lots of side turning on a route does not affect their choice and that this feature ranks 9 out of the 11 cycle route characteristics.

#### 4.2.8. Survey respondents and use of an internet based route planner / GPS

- In question 24, respondents were given 13 different map features to choose from and rate from 1 to 10, 10 being very useful and 1 completely useless. The large majority, 85%, consider that an item that could show different quality of routes is the most important item. Secondly, 80% of respondent consider that it would be useful to see short-cuts on the map.
- On the contrary, 53% of respondents think that having photos and street views of the route is not necessary. A small majority, 53%, consider that seeing links to public transportation would be somewhat useful: this is a reflection of the actual lack of bicycle facilities within the public transportation network. Again a small majority, 55% responded that having safety and security tips on the website would be of some use.

4.2.9. In questions 25 and 27, where respondents have to choose between given items, it appears that bike parking with 90%, bike shop with 85% and train station with 75%, are the most important items to be incorporated in a map.

#### 4.2.10. Open style questions 26-28:

- In question 26, when respondents are asked to make suggestions, the principal item they wish to see on the map is bike shop/garage/petrol station because it is an accessible facility to repair punctures and other mechanical problems. Therefore, as it comes up in both directed and open style questions as an important feature, showing bike shops seems to be a high priority.
- Another important item coming out of open style questions are bicycle lanes. Respondents express the desire to see cycle lanes clearly indicated on the map, including the different cycle lane characteristic such as their quality, if they are contra-flow etc... This information can represent a complementary element to question 24 answer: indeed and as noted above, 85% of respondent said indication of different route quality was their primary focus.

4.2.11. **User survey conclusions:** From the survey it appears that short-cuts, presence of cycle lanes, their respective safety and quality, particularly road-

surfacing, are a highly-requested function for the map, along with bike shops and repair stations.

### 4.3. Functional area of map-

#### 4.3.1. Options-

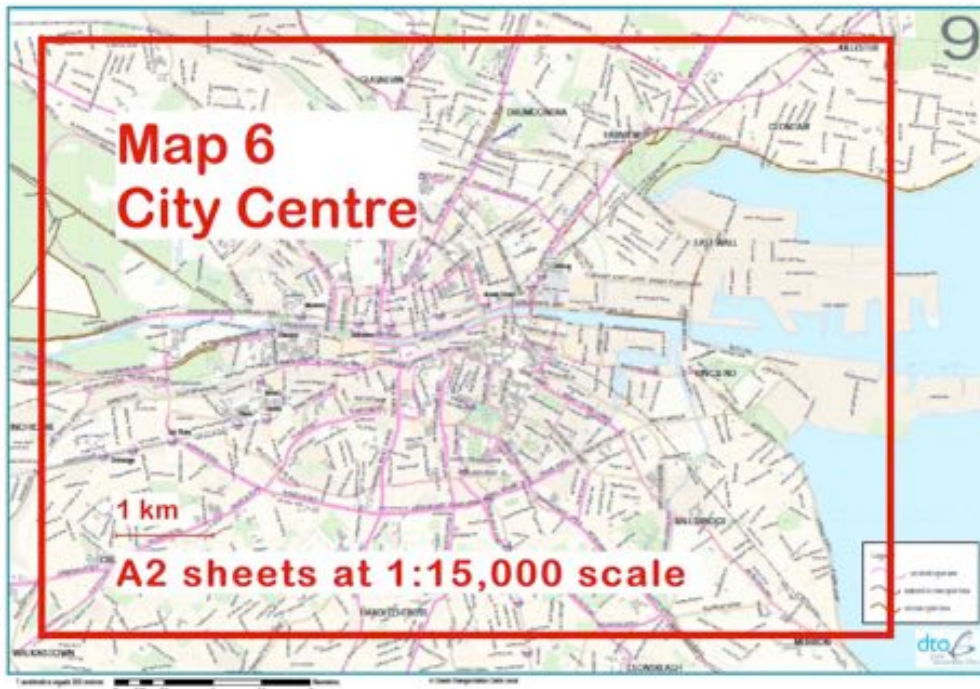
- Area of all four Dublin local authorities;
- Main conurbation and immediate suburbs 'Contiguous Dublin conurbation' (as in Ordnance Survey Dublin Street Atlas; the triangle between Malahide, Lucan and Bray);
- Dublin City Council area only;
- Within the canal cordon only.

4.3.2. **For online map**, the functional area need not be limited, and could indeed bleed out of the Dublin area altogether, covering adjacent counties and eventually other cities. A good starting point is proposed as the four local authorities, which covers the majority of the conurbation. This would be limited by the availability of resources for surveying.

4.3.3. **Printed map**: For legibility, based on the findings of section 3.7.3 above, the scale ought to be in the region of 1:15,000. For convenient use outdoors during cycling journeys, a small area of paper is best. The majority of the printed maps reviewed above are of A2 size, folded to DL. This assumes the reverse map side would be used for public transport details, supplementary maps, safety & training information, security information, contact details for bike shops, cover pages, etc.

4.3.4. A **total of ten** maps at this scale and size would be necessary to cover the bulk of the full conurbation, as shown in the image below. Ten NTA Bus/Cycle Lane maps (see 3.2.2 above), at 1:25,000 and A3 printed size, are required to display no. 2 above, the Malahide/Lucan/Bray triangle, and it would be logical to roughly match this configuration, albeit with slightly different scale/size requirements. Though it would be ideal to cover the entire area with one publication, this would result in either too small a scale, resulting in loss of the detail needed for planning a cycle journey, or a sheet of paper too large to be convenient in use. The best solution may thus be to follow the Transport for London precedent and print a map on **both front and back** of each sheet, reducing the number of publications to **five**. The A2 area might then have to be slightly increased, perhaps to an additional fold, to allow legend, advertisements, advice on cycling in traffic, etc..

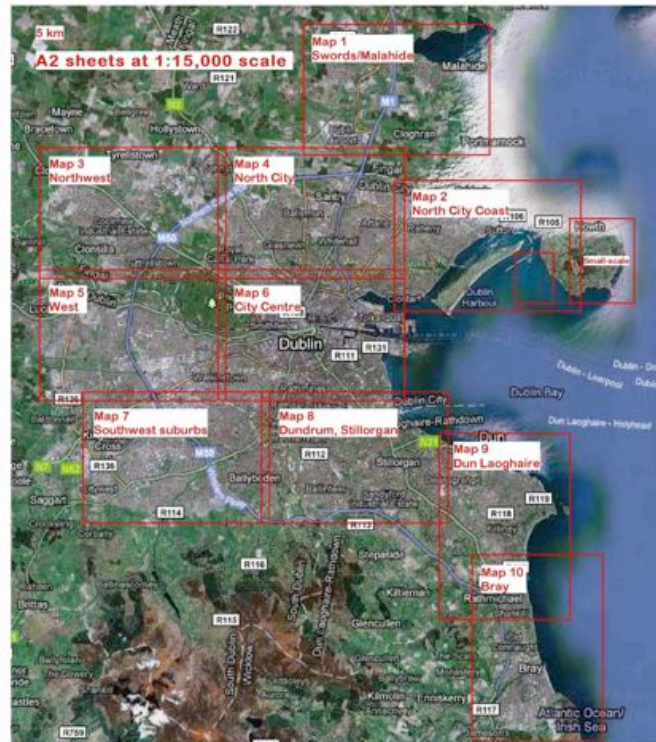
4.3.5. (Below) Image showing NTA map of city centre, with recommended extent outlined in red-



4.3.6. The 'city centre' map above would cover an area stretching from Chapelizod to Clontarf, and from Glasnevin to Rathmines, with adequate space for a legend, scale bar, north point, etc. This area is rich with cyclists, commuters and tourists (from Census data & locations of major tourist attractions), so it is considered reasonable that this area be focussed on in this report as a pilot or 'flagship' map which would provide a test case for the following maps covering suburban areas.

4.3.7. This map would, on its reverse, show the map of western Dublin showing Phoenix Park, Neilstown, Lucan and northern Clondalkin (see below), thus serving an important residential & commuter area.

4.3.8. (Below) Image showing map of larger conurbation, with proposed A2-sized maps at 1:15,000 scale outlined in red.



4.3.9. Maps 1 and 2 would be combined front & back of one publication; maps 3 and 4 likewise, and so on.

#### 4.4. Conclusions re functions to be included:

4.4.1. With reference to precedents, user survey and Transport Research Laboratory study:

4.4.2. **Necessary:** Per cartographic convention, TOSSLAD (Title; origin; scale; source; legend; author; date).

- North point
- Scale bar in km **AND/OR** give distance, time for journey including time spent dismounted/walking, time lost/gained on hills, at traffic signals, etc.;
- Choice of route/road/street quality **AND/OR** Quality of all routes indicated graphically or otherwise;
- Presence and status (mandatory, advisory, in bus lane, sub-standard, etc.) of cycle lanes or tracks;
- Presence and status of bus lanes;
- Information updated frequently (biannual assumed to be reasonable)
- Bike shops; bike parking (with number of stations), bike rental stations (both dublinbikes and other e.g. Phoenix Park Cycles)
- Points of interest – church, library, Garda station, concert hall, hotel, etc. as edited by permission from Ordnance Survey Ireland maps;
- Safety tips (recent work by Galway Cycling Campaign in summarising advice in ‘CycleCraft’ (John Franklin, 2007, Stationery Office) is suggested as useful); information on cycle training;
- Security tips from Gardaí;

4.4.3. Useful:

- Route photos, street view photos;

- Carbon calculator;
- Calorie counter;
- GPX export for users' GPS device;
- Presence of leisure cycling routes;
- Time-sensitive route planning service taking known average traffic fluctuations, traffic light phasings etc. into account;
- Live weather reports & forecasts including rain and wind speed; weather information (phone no. etc. for printed map);
- Live traffic information; info phone no.;
- Live road-works information/ City Council information phone no.;
- Location of precise street address, house number etc. from GeoCode or similar commercial entity, or from proposed National postal code databases;
- Information on public transport; link with timetables & reservation systems for trans-modal journeys
- Suggested links from an online journey planner:
  - Department of Transport;
  - Dublin Cycling Campaign;
  - dublinbikes.ie;
  - City Council:
    - dublincitycycling.ie;
    - traffic CCTV cameras;
    - Roads maintenance department;
    - Cycling officer;
    - Motor vehicle parking enforcement information;
  - National Transport Authority;
  - Waterways Ireland;
  - Dublin Bus including 'Dublin Buster' phone application;
  - RPA for Luas timetables etc.;
  - Irish Rail to timetables, ticket booking facility, cycle parking at stations, etc.;
  - NRA National Cycle Network when it is realised;
  - QBN office;
  - Dublin Airport Authority;
  - AA live traffic map.

All the above must be incorporated into the brief for the graphic design of the map or journey planner.

## 5. How are routes surveyed and evaluated?

5.1.1. Each of the above maps and planners employs some method of evaluating a cyclist's likely level of comfort on a certain route. The various factors affecting quality must be objectively assessed, and then combined into a simple indicator, which can finally be output to a map or journey planner. Several philosophies and methods of surveying and evaluation are in use, with differing levels of detail or information.

### 5.2. Precedents for evaluating routes:

5.2.1. **Show gradient only** (Paris and Lausanne maps) While gradient can often be important for cyclists, it is considered a lesser consideration in the urban context, given the results of this study's user survey, the relative discomfort experienced from gradient compared to heavy traffic in close proximity, not to mention Dublin's relative flatness.

5.2.2. **Show gradient** combined with known official road **carriageway**, junction, and bus/bike lane information. (BBBike, NTA planner). Carriageway classification is of primary importance for cyclists. Primary or national routes provide hostile environments, while quieter, often residential streets are attractive. Adding bus and bike-lane information goes a long way to creating a full picture of a journey.

5.2.3. **CSNA** (Cycle skills network audits). This system was devised by Transport Initiatives, a UK transportation consultancy, and rates a 'network' in relation to the UK's official National Standard for Cycle Training, which is marketed as the 'bikeability' standard, presently undergoing distribution to schools throughout the UK.

5.2.4. 'Bikeability' training has three levels, which might be approximately described as- Cycling with no traffic whatsoever, so as to learn to use and control the machine; cycling on quiet streets with little traffic; and cycling on busy streets where negotiating/commanding a right of way with other road users is necessary. CSNA expands the three Bikeability stages to seven levels:

- **Potential Level 1** Key motor traffic-free links not currently available to cyclists (due to legal / physical restrictions)
- **Level 1** Motor traffic-free cycle routes, plus streets with extremely low levels of calmed traffic (e.g. Home Zones) suitable for all cyclists
- **Level 2** Roads / cycle tracks suitable for cyclists at Bikeability Level 2
- **Level 2** Off-peak Some roads are quiet and safe for cyclists at Level 2 at off-peak times only. These are classified Level 3 at peak times and Level 2 at others.
- **Level 2.5** Roads / cycle tracks suitable for cyclists at Bikeability Level 2, except for turning manoeuvres across traffic
- **Level 3** Roads / cycle tracks suitable only for cyclists at Bikeability Level 3
- **Level 3.5** Roads where the level of risk is so high it is a barrier to even the most experienced cyclists.

5.2.5. **Cyclenation Mapping Standard:** Cyclenation, formerly Cycle Campaign Network is an umbrella body which co-ordinates the many UK cycling campaign groups. In 2008, a sub-committee of Cyclenation produced a document 'Mapping Cycle Friendliness; Towards a National Standard', based on Transport Research Laboratories report 490, 'Cyclists' assessments of road and traffic conditions: the development of a cyclability index'. Simple guidance for surveying and evaluating routes, referring back to the Cheltenham model of grading routes, is set out. Five classifications are applied:



- **Yellow** Quiet roads with little traffic and low traffic speeds. Generally suitable for all cyclists. These are mostly non-distributor residential streets or roads through parks.
- **Green** Through routes with moderate traffic and low speeds. Suitable for Level 2 and Level 3 cyclists; perhaps Level 1 at less busy times, under supervision. Shopping streets and industrial premises should be classified green as a minimum due to the complexity of the traffic environment.
- **Blue** Busy roads, including A or B roads, where road design is traditional and does not lead to excessive speed. Few HGVs. Road width allows safe overtaking of cyclists over the greater part of its length. Suitable only for Level 2 and Level 3 cyclists.
- **Red** Busy principal roads, perhaps with some HGVs. Road width restricted, leading to increased risk from overtaking vehicles. Traffic speed high relative to road width with drivers less willing to cede right of way to cyclists. Complex junctions. Suitable for Level 3 cyclists and some Level 2.
- **Purple** Fast, busy roads with frequent HGVs. Motor vehicle-orientated road design, such as use of slip roads, large roundabouts. Restricted lane width. Suitable only for Level 3 cyclists.

Data description	Method of collection	Importance in influencing cycle journey route
Motor vehicle speed	Occasional speed surveys can provide a benchmark	High
Lane width	Sample measurements on site or can be measured (approximately) from OS 1:2500 or larger mapping)	High
Frequency of side turnings	Map, or perhaps Google Earth	High
Gradient	Map (e.g. number of contour lines per 1000 m of distance)	Medium
% of large / heavy vehicles	Traffic counts (manual or automatic)	High
Road surface condition	Road condition surveys, although automatic surveys may miss some of the features which are most annoying or dangerous for cyclists	High
Frequency of road traffic accidents involving cyclists	Local authority records from STATS 19 forms	Low
Frequency of complex / intimidating junctions	Site survey of major routes	High

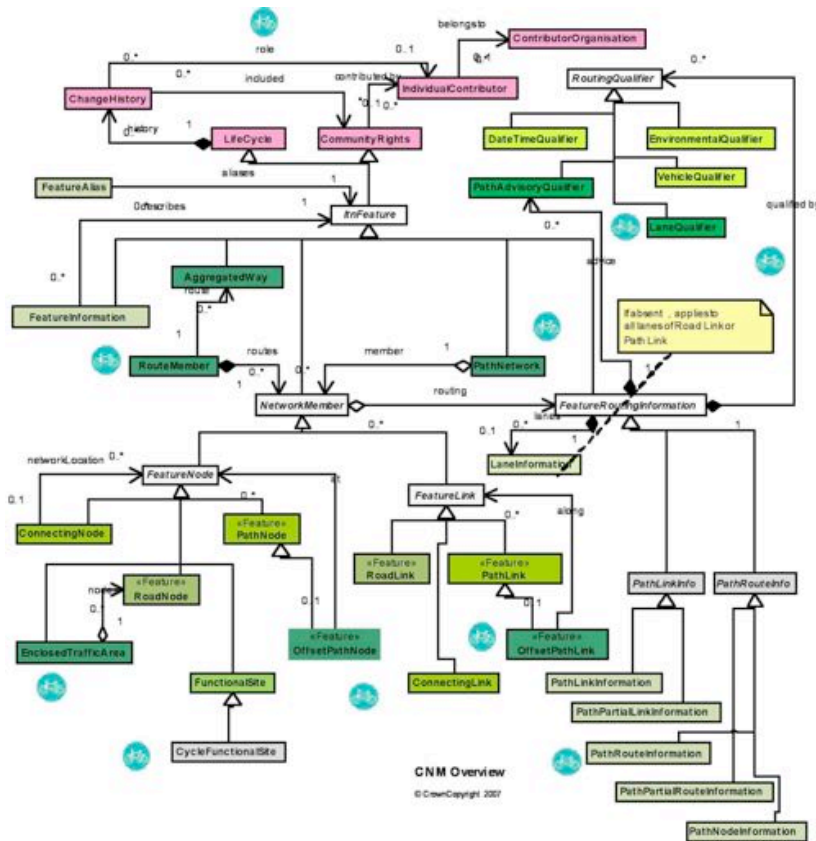
- (Above) Table of data for survey of link & evaluation from **Cyclenation** 'Mapping Cycle Friendliness' document. See also Appendix 16.

#### 5.2.6. **Transport Direct** Cycle Network Model (CNM):

- This system has been devised over recent years for use in the UK official journey planner referred to at 3.3.5. It is to be used by local authorities in the officially-funded collection of route quality information, for inclusion in these national database Transport Direct maps. It is publicly available. The cycle journey planner has absorbed public funds of over £2m to date. See Appendix 8.6 below.
- The evaluation is geared towards preparation of a schema, or data-sharing system, called CycleNetXChange Cycle Network Model, which is overseen by the UK Department for Transport. The data will be XML-based, allowing transfer to standard route planning software. This in turn

will be used within the Transport Direct website, which aims to integrate all transport modes in a single journey planner i.e. provide pedestrian, motorist, train & bus timetable, even air travel information for a user's given journey. It is to form a cycling map of England, Wales and Scotland.

- Local authority surveyors are intended to input a variety of data, which is defined by the official specification.
- The data will be joined with existing UK OS 'integrated transport network (ITN)' information which maps and classifies all UK roads. UK OS also make pedestrian network information available, which is to form part of the CNM.
- This listing appears extremely comprehensive if not exhaustive, covering a broad range of information from contributor name and status, through geometric characteristic of routes and traffic signalling en route, to subjective judgements of routes such as whether public security incidents have occurred along a route.
- A full study of this system is beyond the capabilities of this study; a brief review has been undertaken only. The relevant listing of route or network characteristics will be appended.
- (Below) Sample diagram illustrating CNM overview-



- (Below) sample extract from Attribute Description schedule of CNM:

Direction of Cycle Flow	<b>CNM / RRI &amp; PRI / LaneQualifier / directionOfFlow</b>	<p>The direction(s) of cyclist flow on a LANE or LANES associated with a ROUTING INFORMATION of PATH LINK(s) or ROAD LINK(s).</p> <ul style="list-style-type: none"> <li>• Allowed in both directions.</li> <li>• Closed in positive direction.</li> <li>• Closed in negative direction.</li> <li>• Closed in both directions.</li> </ul> <p>If not present, Direction of Cycle Flow is the same as the DIRECTION OF TRAFFIC FLOW specified by the ENVIRONMENTAL QUALIFIER / INSTRUCTION</p>	0:1	As referenced for road / path
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Surface	<b>CNM / RRI &amp; PRI / LaneQualifier / surface</b>	The surface of a LANE or LANEs associated with a ROUTING INFORMATION of a PATH LINK or ROAD LINK. <ul style="list-style-type: none"> <li>• <i>Tarmac</i></li> <li>• <i>Paved, good for bikes in good or poor conditions</i></li> <li>• <i>Cobbles, not good for bikes</i></li> <li>• <i>Unpaved firm, passable by most ordinary cyclists</i></li> <li>• <i>Unpaved loose, passable by mountain bikes only</i></li> <li>• <i>Unpaved firm when dry, passable by mountain bikes in dry weather only</i></li> <li>• <i>Steps, cyclists would need to carry their bike.</i></li> <li>• <i>Steps with channel, includes a channel to wheel bike.</i></li> </ul>	0:1	tarmac
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### 5.3. Route evaluation- 'All-Street Option' versus 'Cycle-Routes Only' Option:

5.3.1. From the above precedents, **two main types** of cycle map can be identified as relevant to our study: firstly the map on which **all roads** are graded for cyclability; and secondly the map on which only some roads are highlighted so as to show '**recommended cycle routes**'. Examples of the former include the 'Cyclenation' Cheltenham and Gloucester cycle maps; the classic examples of the latter are the CNM-derived maps of London. A third type of map, as used in the US, has only solid or dashed lines to indicate the desirability of routes, and though commendably simple, it is felt that this approach offers insufficient information for cyclists navigating the dense street patterns of Dublin.

5.3.2. There are two principal disadvantages to the '**recommended cycle routes**' style of maps: firstly they only cater for a small proportion of the routes that cyclists may wish to use; secondly they do not provide information of interest to all types of cyclists. On the other hand, with the Cheltenham-style maps on which each road is graded, there is maximum versatility with regard to understanding the cycle skills required to be able to cycle any route with confidence. Therefore it is useful to cyclists of all skills. The study team strongly recommends the 'All-Street Cycle Map Option'.

### 5.4. Recommendation for mapping standard

5.4.1. It is also strongly recommended that this mapping standard - described in more detail below - becomes the standard with which all urban cycle maps are produced. Therefore, for example, a cyclist who is familiar with using a Dublin Cycle Map based on the 'All-Street' system - and its grading of routes into the 5 levels - would readily be able to locate suitable routes on a map of Waterford produced using the same system. In the UK, there is an extraordinarily large and confusing variety of cycle map types with the two main systems and a multiplicity of symbols in use. There is now a strong desire to standardize the UK cycle maps produced using the Cyclenation system (12.1.6 below).

### 5.5. Grading System, Gradations and Background Colours

5.5.1. The system for the grading of routes recommended here is based on a subdivision of roads into 5 categories. These are listed and explained in 5.2.5 above. See also the sample cycle map (Appendix 9 below) showing the Harolds Cross / Kimmage / Crumlin area.

5.5.2. In essence, the stress levels experienced in cycling on the roads increases as one goes from yellow to purple.

5.5.3. In general, most roads step up one level of difficulty as traffic levels rise but, relatively, the system of 5 distinct grades still holds. In principle, there may be lengths of roads on which traveling in one direction may correspond to a level of difficulty greater than traveling in the opposite direction - but these situations are likely to be very uncommon. In principle though, it would be possible to mark one side of the road in (say) green and the other half in (say) blue.

5.5.4. There may be lengths of roads for which it is difficult to decide on one of two grades. The advantage of the 5 level system is that if a road construed by a surveyor is felt by cyclists to be an inappropriately high or low grade, then it is likely to only be one grade out, and therefore not make too much of a difference.

5.5.5. It can be seen on some UK-produced Cycle Maps - e.g. Edinburgh - that "X"s are shown at particular crossings or junctions so as to highlight potentially hazardous locations. However this is not recommended since such symbols could send out excessively alarmist messages to all users about the hazards posed by a particular junction. Furthermore it provides no useful information on the level of skill that is required to negotiate a particular junction safely. What this report recommends is that one grades the junction (and, if appropriate, the lengths of roads leading to it) according to the colour system described above. Cyclists will then know what level of skill is required.

5.5.6. The colours representing the grading - Yellow, Green, Blue, Red and Purple - are not set in stone and some UK cities have (slightly inexplicably and perhaps inadvisedly) deviated slightly from this system. However it is recommended that this same 5 colour and same colour palate system is followed - unless a very good reason to deviate from it is unearthed. In this way, cyclists from the UK familiar with the Cycle Nation standard can use the Dublin Cycle Map with ease. Furthermore it is understood (12.1.7) that this palate of colours is deemed acceptable for the colour-blind.

5.5.7. To maximise up-take and usability, an attractive and user-friendly design should be carried out by graphic designers with extensive, relevant professional experience.

## 6. How would the printed map be constructed & updated?

### 6.1. Administration tasks:

- Finalisation of brief for functions; drafting of advisory text, legend etc.;
- Naming & branding;
- Sourcing, negotiating advertising;
- Sourcing, negotiating sponsorship;
- Sourcing quotations for graphic design, cartography, printing, distribution;
- Contacting outlets to ensure extensive display, sales, timely re-ordering.

6.1.1. In the case of the UK's largest mapping project, London Cycling Campaign give the necessary cycling input for drafting the London maps; Transport for London carry out design, printing and distribution. This collaborative approach has not been followed in preparation of this study, but may merit further consideration.

6.1.2. Costs have been summarised in financial summary, under separate cover.

### 6.2. Base map information:

6.2.1. Would be supplied by Ordnance Survey Ireland (OSi) and used by license (subject to fees). Would include route classification, names of roads/streets and pedestrian ways etc., located points of interest. Ordnance Survey Ireland information would be preferred due to its long-standing high reputation not only with the public, but also with local authorities or State bodies who might be asked to promote or sponsor the map.

6.2.2. Costs for OSi data and royalties have been summarised in the financial summary, under separate cover.

6.2.3. An alternative, lower-cost source for the base map would be OpenStreetMap, which would provide information for no cost but with the drawback of possibly reduced accuracy, or perception of same.

### 6.3. Surveying routes and finalising the information for the map:

6.3.1. Routes must be surveyed by qualified cycle training instructors or, at the very least, by experienced and confident cyclists who understand the principles and practice of the grading system.

6.3.2. **Stage 1** of the survey is a **desk-based exercise**. Local knowledge and educated guesses derived from a careful reading of the map produce an initial grading of all roads into the 5 categories described in 5.5 above. So, for example, quieter residential streets that are not through-routes can be given an initial grading of 'yellow'. In addition, features or points of interest must be added at this stage, as follows-

- Cycle lanes or tracks – mandatory, advisory, sub-standard, off-road;
- Bus lanes;
- Bike shops;
- Significant bike parking locations;
- Bike rental locations; This information to be drafted for desk study from directories, local authorities, etc., and confirmed during street survey

6.3.3. Then, **Stage 2** requires the surveyor to cycle each of the roads so as to confirm that his or her initial desk-based grading is correct or needs to be amended.

6.3.4. **Stage 3** involves seeking feedback on the grading of all roads in a particular area from other surveyors who are covering adjacent areas of the same map - i.e. cross-checking is required to ensure consistency.

6.3.5. **Stage 4** involves circulating a draft cycle map for wider consultation. At this juncture, the surveying team may receive recommendations for changes from experienced members of the cycling public on particular elements of the map. This affords the opportunity for the surveyor(s) to revisit a particular site, with the local cyclist, and to amend the map if appropriate.

6.3.6. **Stage 5** is the final agreement on the categorisation of all routes before publication.

6.3.7. **Survey work programme:** A trial survey was carried out of a 4 km<sup>2</sup> area around the Harold's Cross suburb of Dublin, where a mix of national, primary, secondary and tertiary residential roads can be found, along with dense Medieval street patterns. Time taken was as follows-

- A desktop study for the 4 km<sup>2</sup> area was partially completed, the total time estimate for this first stage being approximately 2 hours.
- In stage 2, the on-site survey, a total of 12 km of route was covered in approximately 1.5 hours.
- In a combined session, three experienced cyclists reviewed the initial sketch map in approximately 30 minutes (stage 3).
- Extrapolating from this to estimate the time needed for the proposed city centre map, which extent is 66 km<sup>2</sup> in area and 1,100 km of road length, assuming **all streets** are covered: 15 times the area of the trial, and 92 times the road length-
  - Stage 1: Desktop survey estimate  $2 \times 15 = 30$  hours;
  - Stage 2: On-site survey estimate  $1.5 \times 92 = 140$  hours;
  - Stage 3: Review estimate  $0.5 \times 15 = 7.5$
  - Stage 4: Administration estimate 10 hours
  - Stage 5: Make alterations based on consultation and sign-off; estimate 20 hours.
  - **Total approximately 200 hours for survey of streets for central Dublin map.**
  - Costs have been summarised in the financial summary, under separate cover

#### 6.4. **Cartography, design: tasks:**

- Graphic design;
- importing & displaying base map; editing base map for clarity, to show relevant features only
- Drafting out survey data (colour grading of road segments, inclusion of bike lanes, parking etc.)
- Checking and revision

6.4.1. An outline quotation for this work, relating to the city centre map, from a Dublin-based graphic design consultancy with relevant experience has been Costs have been summarised in the financial summary, under separate cover.

#### 6.5. **Ongoing maintenance & administration tasks:**

- 6.5.1. Updating survey data co-ordinate with OSI;
- 6.5.2. Responding to customer feedback; arrange programmer to adjust software;
- 6.5.3. Linking with external data; update links & other information on an ongoing basis

## 7. How would the online map be constructed and updated?

### 7.1. Introduction:

7.1.1. The creation of an online journey planner from first principles appears to be unwarranted, given the financial crisis, the existing fully-functional planners which can be readily adapted, and the possible upcoming release of the Google journey planner. Research indicates that the CycleStreets platform will provide the best cost-benefit results by adaptation.

7.1.2. Outline negotiations with the CycleStreets producers have taken place with a view to investigating the feasibility of this adaptation. CycleStreets propose to produce the following for a Dublin cyclists' map:

- Customised domain name;
- Custom site design;
- Guarantee of continuity of service;
- Development time to improve the routing engine for Dublin conditions;
- Outline costs of this service, with a continuing maintenance provision to be agreed, have been imported into the financial summary, under separate cover.

7.1.3. As a temporary alternative, the Cyclestreets planner is functioning adequately at the moment, and, if its existing design and branding is accepted, it can be promoted, publicised and used by cyclists as it currently stands. Any alterations necessary to the base map can be carried out independently. However the platform currently has limitations on bandwidth and hosting, so a formal agreement to guarantee continuity would be a matter of some urgency.

7.1.4. **Online journey planner function:** Cyclestreets import data from OpenStreetMap, the voluntarily-edited online map, on a weekly basis, and the route-planning engine for users is already in place. Further to testing by the study team it was found to function well, though some slight adjustments of the software are proposed. OSM data in the study trial area, the Harold's Cross suburb, proved to be reasonably accurate.

7.1.5. **Detail on map:** Currently, the CycleStreets route-planning engine uses information on street classification, cycle lane, and pedestrian way only, so does not benefit from the richness available from a qualitative study such as that proposed for the printed map, above. However the OSM database can, given the requisite resources, be filled out to a very rich level of detail, including road or cycle lane widths, surface quality, road signage, etc. and the route planning software can be adjusted to take these into account. Thus this system is well positioned to develop in future.

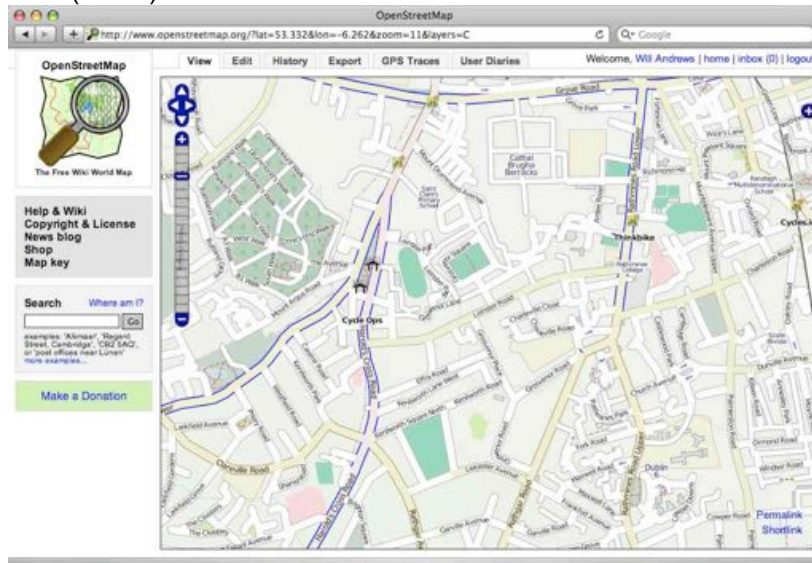
7.1.6. **Extent of map coverage:** The online map must cover as fully as possible the entire Greater Dublin area. OpenStreetMap data was studied for the Harold's Cross area only; no testing was carried out on other suburbs, and some editing of survey information may be necessary in some areas. This can readily be carried out in conjunction with the survey for the printed map, however.

7.1.7. **Desktop study:** To assess the feasibility of checking & if necessary editing the OSM data, a trial working session was carried out. The following steps were followed-

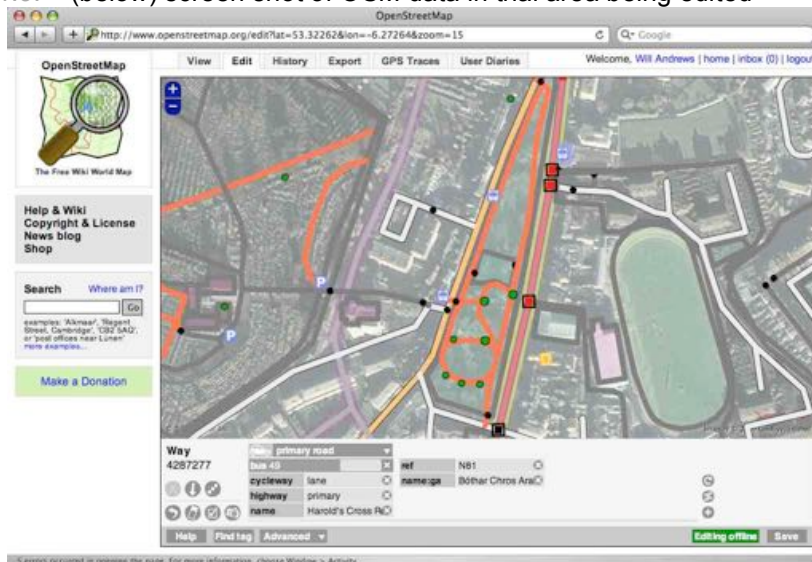
- the OpenStreetMap data was examined by a team of four cyclists familiar with the Harold's Cross area. It was compared with other data e.g. DTO/NTA maps of cycle lanes referred to at 3.2.2 above, recent street map publications and local knowledge.

- Brief training in accessing and editing the OSM data was carried out.
- Several elements (bike shops, adjustment to bike lanes) were edited in the map source database.
- The majority of the 4 km<sup>2</sup> trial area of Harold's Cross was checked and updated in 2 hours by a team of three (data was found to be of high accuracy already). It was found that the OSM data was largely accurate, but that it could be readily updated by experienced cycling surveyors to provide a good standard of information for cyclists.
- This can be carried out as an adjunct to the survey for the printed map, as outlined at 6.3.1 above.
- Extrapolating from the trial, the 66 km<sup>2</sup> area of the central Dublin map will require surveyors' data input time of approximately  $(4 \div 6) \times 66 = 44$  hours. Budget estimates for this have been collated in the financial summary, under separate cover.

7.1.8. (below) screen shot of OSM data in trial area viewed for checking-



7.1.9. (below) screen shot of OSM data in trial area being edited-



7.1.10. (below) screen shot of OSM data in trial area with excerpt of tags list on screen-



The screenshot shows the OpenStreetMap interface with a 'Popular tags matching cycle' table overlaid on a map. The table lists various tags and their counts across different map elements. Below the table, the 'Way' editor interface is visible, showing details for a specific road segment.

Tag	Total	Ways	Nodes	Relations	Action
guidespost = bicycle	171	0	171	0	More
information = bicyclemap	142	1	141	0	More
winding = bicycle_sube	132	0	132	0	More
ref_name = Avon Cycleway	114	114	0	0	More
amenity = motorcycle_parking	112	4	108	0	More
note = FDMU: did batch add of s.	111	110	1	0	More
clopin:route = cycleslow	83	83	0	0	More
depot:rd = cyclestore	81	81	0	0	More
ref_ref = 11 - Northern Warwicks	80	80	0	0	More
proposed = cycleway	82	82	0	0	More
name = M7 Cycleway	78	77	0	1	More
cycle = no	45	45	0	0	More
cycle = yes	41	38	4	1	More
cycle = designated	4	4	0	0	More
signals:cycle = 1 00 20:00-06:00	1	0	1	0	More
cycle-parking = no	1	0	1	0	More
breway:cycle = no	1	1	0	0	More
cycle = opposite	1	1	0	0	More

Way editor details for Way 4287277:

- primary road
- bus ID
- ref: N81
- cycleway: lane
- name:ga: Bothar Cross Area
- highway: primary
- name: Harold's Cross RC

7.1.11. Once guarantees of continuity of service are in place from the CycleStreets organisation, no further significant action will be necessary to enable the journey planner, only feedback and biannual review of the mapping information. This is the procurement method adopted by the London Cycling Campaign for their journey planner (<http://maps.camdencyclists.org.uk/>).

## 8. How would the map be published & distributed?

### 8.1. Potential market:

8.1.1. **6,850** cyclists crossed the Canal Cordon during the City Council's November count (12.1.9) (An increase of 74% has been recorded over the past five years) This represents 75% of all commuters. Summer months would naturally show a marked increase on this, and it would be reasonable to assume that there are 10,000 commuting cyclists visiting the central area, with more in outlying suburbs.

8.1.2. Census figures show **19,959** cycling commuters travelling by bike in the Greater Dublin area.

8.1.3. Dublin Bikes had **1,101,877** trips in first year with 44,097 subscribers. (Short-term (3 day) Dublin Bike subscribers numbered 15,928 in the first year; it would be expected that many of these would be visitors / tourists).

8.1.4. Cycling Ireland has **68** competition clubs registered in Dublin county (12.1.10).

8.1.5. In Ireland **90,000** bikes were sold in 2008 and it would be expected that this number will greatly increase in the following years since the introduction of the 'bike to work' scheme and the general increase in the popularity of cycling in Dublin in recent years (12.1.11) As roughly 28% of the country's population is in Dublin (12.1.3), it follows that **25,200** bikes are bought each year in the target geographical area.

8.1.6. The Ordnance Survey Dublin Street Guide has a circulation of almost 100,000. Given that 2009 City Council figures show 7.5% of commuters travelling by bike, a 'core market' of 7,500 might be expected. This market would be part of the larger cycling public including leisure & utility cyclists.

8.1.7. The *Dublin Visitor Map* was examined as a particularly relevant example, as it applies only to a section of the population, is produced for a specific purpose, and covers the city centre area only. The map was designed by author and artist Pat Liddy and is published by the Dublin City Business Association. Despite competition from similar tourist maps, guide books and Ordnance Survey, it has a 1 million map print run with a 12 month life span and recoups the majority of its production costs through advertising (12.1.12.).

8.1.8. The Association of **Greater Manchester** Authorities produces a series of 10 maps covering the Wigan, Bolton, Bury, Rochdale, Oldham, Tameside, Manchester, Salford, Trafford and Stockport areas. Overall population approximately 2.5 million. The print run was 60,000 on initial production in 2006, and has since risen to 100,000 (12.1.8). Extrapolation to Dublin's population of 1.2 million gives an annual circulation potential of **48,000**.

8.1.9. CDL Logistics carry out distribution of the **Transport for London** cycling maps, a series of 14 printed maps covering the Greater London area. The central city areas have the larger demand, and an increase in demand was noted around the launch of the Barclays Cycle Hire Scheme ('BorisBikes') in July 2010 (12.1.14). For the five months from June to November 2010, CDL distributed 300,000 maps, giving an approximate annual average of 720,000. Extrapolating, with a Greater London population figure of 10 million, (12.1.15), the circulation potential for Dublin's 1.2m would be **86,400**.

8.1.10. **Conclusion: 50,000** is a reasonable initial print run for the City Centre map.

### 8.2. Distribution: printed map:

8.2.1. Essential to the success of any printed map is putting in place a good distribution plan. This will involve targeting and identifying best placement for the map and regularly refilling it. The best outcome is that the map becomes a benefit to bike retailers, tourist accommodation etc. to encourage stockists to re-order before it runs out, and that there is a system in place to restock them. The London maps, as mentioned above, are distributed by a sub-contractor, while the Manchester maps are distributed in-house, by the local authority via the national postal system.

8.2.2. Distribution might best be achieved by providing free restocking for certain outlets. A date every month would be designated as a delivery day, the outlets would place their order before this with the quantity they require. This means that only one day has to be budgeted for travel and transport and delivery. It will be possible to have emergency supplies in-between but it should be best to keep orders on a scheduled basis. It will be a good idea to start off with targeted outlets rather than flood the city with the maps; more value and demand will thus be given to the maps.

8.2.3. **Draft network of potential distribution outlets:** (12.1.13)

Outlet type	Number of outlets or branches	Yearly distribution per outlet	Total
Directly to consumers downloaded in PDF format or by phone/website order form (estimated)		7,500	7,500
Bookshops	Approx. 85	Ave. 500	42,500
Tourist offices	4	6,000	24,000
Garda stations	Approx. 40	50	2,000
Bike shops	40	500	20,000
Libraries- FCC 9; SDCC 8; DLRCC 12; DCC 22	51	300	15,000
Local authority offices	8	100	800
Irish Rail & Dart stations	54	200	10,000
Busarus	1	2,500	2,500
Hotels	300	50	15,000
Use as poster on bus stops, dublinbikes sites, attached to bike parking, traffic signal boxes, etc.	75	1	75
<b>Total potential</b>	<b>529</b>		<b>139,375</b>

- Many of these outlets would only accommodate free distribution: e.g. local authority offices cannot function as bookshops by selling books or maps.
- This supports the 50,000 quantity indicated above.
- Outlet counts are for the greater Dublin area, which is proposed in section 4.3 above to be covered by five double-sided publications. So,

each stockist, hotel, library etc. would be stocked either with its local area map – also perhaps any near-bordering ones- and perhaps also the city centre map. This adds a layer of complexity to distribution; the alternative of issuing all five maps to all outlets would solve this but at the expense of some inevitable wastage.

- Substantial support is assumed here from State and semi-state bodies, both in distributing and promoting the map. That libraries etc. host the document, and that it is publicised by transport and health promotion bodies, is crucial. It follows that such bodies must be made aware of and be satisfied with the quality of the map.

**8.3. Distribution: Printed map: Work plan and budget:** This information tabulated in the financial summary, under separate cover.

**8.4. Distribution: online journey planner:**

8.4.1. Hits to the NTA cycle journey planner, <http://www.nationaltransport.ie/travelinfo.html> numbered **15,996** between December 2009 and July 2010 (its first 6 months of existence) with an average visit time of 2:38min per visit.

8.4.2. Hits to the City Council/NTA Transport for Dublin map web page <http://www.transportfordublin.ie/maps/> numbered **6,802** for the year between August 2009 and August 2010. This also is a site in its infancy, without significant public promotion.

8.4.3. Based on this data, it would be reasonable to expect that a well functioning cycle map / route planner, once established, would receive in the region of **50,000** hits a year.

8.4.4. The Transport for Dublin office plans to create a portal site for all the city's online transport information, and this office has taken charge of the DTO/NTA Walk & Cycle Journey Planner. The Transport for Dublin office has informally indicated a willingness to link their proposed motorists' or inter-modal journey planner (which is envisaged to guide motorists during the 'big dig' construction stage for Metro North and Dart Underground) with a cyclists' planner. This would appear to be a sympathetic and logical home location for the cyclists' journey planner.

8.4.5. Alternatively the City Council's [www.dublincitycycling.ie](http://www.dublincitycycling.ie), or Smarter Travel's [www.cyclesmart.ie](http://www.cyclesmart.ie), if and when activated, would be appropriate portals for housing or linking to the online map.

8.4.6. The Dublin Cycling Campaign would seek to prominently display links and promotion of the map, assuming its quality was adequate.

**8.5. Revenue estimates**

8.5.1. Revenue for the online planner has not been estimated; initial research indicated that actual advertising income from such sites is not significant. At 50,000 hits some revenue might be sourced directly from bicycle distributors, etc. but it is considered safer to discount this for the current study.

8.5.2. Estimates of revenue from advertising, based on *Dublin Visitor Map*, have been forwarded to the financial summary under separate cover.

8.5.3. Potential advertisers might include:

- Bike Shops (local and online);
- Bike manufacturers or national distributors;
- Cycle insurance providers;
- Dublin City Council cycle promotion;
- JCDecaux (Dublin Bikes);
- Tourism Industry; Fáilte Ireland;

- HSE through health promotion projects.

8.5.4. Given the benefits a greater cycling culture would have on Dublin (ref. Smarter Travel, City Council Development Plan) it would be hoped that continued funding could be secured from bodies promoting health, sustainable transport and tourism:

- Dublin City Council;
- Fingal County Council;
- South Dublin County Council;
- Dun Laoghaire Rathdown County Council;
- Department of Transport National Sustainable Transport Office;
- Department of Environment, Heritage and Local Government, climate change office;
- Department of Health;
- National Transport Agency;
- Road Safety Authority;
- HSE;
- Irish Heart Foundation;
- Sustainable Energy Ireland;
- Enterprise Ireland;
- Dublin City Business Association;
- Dublin Chamber of Commerce;

8.5.5. All these bodies should be approached when the map production is proceeding. As stated above, it follows that the quality and reliability of the map must be sufficient to be endorsed widely.

8.5.6. If these bodies wish to link to or quote the cycling map, or use it to encourage modal shift, the provision of funding might be linked to conditions on quality control, though it is clear that editorial control (particularly in the grading of routes, the inclusion or exclusion of questionable cycle facilities etc.) would logically be best kept within the cycling community, as occurs with Transport for London's co-operation with London Cycling Campaign on maps there.

8.5.7. While the map would serve Dublin residents it would no doubt be very popular with visitors to Dublin who wish to take advantage of the Dublin Bike scheme and other bike rentals. This also opens the map up to advertising from the tourism market. A possibility for the printed map is to have a section of the reverse side mapping longer off road leisure cycle routes such as, Phoenix Park, Fairview to Rathmines, Grand Canal Cycle path, Sutton to Sandycove etc...

8.5.8. Part of the benefit to advertisers is that a package deal might be made to get web and printed advertising at a discounted rate.

8.5.9. Sales of hard copy map:

- In UK: A sale price of '£1 where sold' is set on Cheltenham map, though local-authority produced maps are often free.
- Ordnance Survey Street Map is €9.99, reduced this year from €12.50; circulation approx. 100,000.
- Sale, rather than free distribution, is considered to be worth consideration: point-of-sale presentation of free literature at retail /library etc. establishments will attract less care in presentation and re-stocking from management of outlets due to the lack of turnover generated.
- Thus, a low/token sale price of €2 is considered worth evaluation. This, would only be possible in outlets geared-up for the sale, invoicing etc. of books & maps, and the preclusion of such outlets as libraries and Garda stations would be a drawback; thus it is felt that the flexibility allowed by

the Cheltenham precedent is worth the potential losses in revenue, and a '€2 where sold' legend is the best option.

- It is considered reasonable that 40% of maps would be sold, and 60% distributed without charge.

**8.6. Conclusion:** Comparing income with expenditure, the project appears to have sound financial viability. Naturally many variables exist, particularly in the circulation estimates, and the map would be an entirely untested product in the Dublin market, so a generous margin of error must be allowed.

**8.7.** Income estimates have been summarised in the financial summary, under separate cover.

**9. Appendix 9: Sample map: Harold's Cross and environs:**

## 10. Appendix 10: Alternative mapping graphic standard



### 10.1.1. Showing:

- Heavy green lines: Pleasant cycling
- Medium lines: Some traffic
- Light green lines: Motor vehicle domination of roadspace
- Red circles: Complex or difficult junctions
- Grey dots: pedestrian links
- 'Price tag' denotes bike shop

10.1.2. This graphic standard is derived from the Google and Fairfax maps, but ignores existing street use patterns to provide a strictly cyclist-oriented map.

10.1.3. Easy routes are strongly emphasised; the user quickly sees how to link origin and destination with the shortest distances of lighter green.

10.1.4. The concept is rejected by the study as having reduced legibility for those used to traditional maps.



**11. Appendix 11: Transport Direct FOI response**

## 12. Appendix 12: References

- 12.1.1. Smarter Travel; a sustainable transport future Department of Transport 2009.
- 12.1.2. 'Government wastes millions on redundant cycle route planner' John Ozimek: The Register, 2010- April 12<sup>th</sup>.
- 12.1.3. 2006 Census figures.
- 12.1.4. 'Mapping Cycle Friendliness; Towards a National Standard',
- 12.1.5. Transport Research Laboratories report 490, 'Cyclists' assessments of road and traffic conditions: the development of a cyclability index'.
- 12.1.6. Personal Communication with John Franklin, Fri 17th September 2010.
- 12.1.7. Franklin, 2010.
- 12.1.8. E-mail from Association of Greater Manchester Authorities Walking & Cycling Officer, 2010- November.
- 12.1.9. Dublin City Council cordon count 2009.
- 12.1.10. Cycling Ireland website count 2010- October.
- 12.1.11. EUROPEAN BICYCLE MARKET 2009 edition by COLIBI, the Association of the European Bicycle Industry and COLIPED, the Association of the European Two-Wheeler Parts' & Accessories' Industry.
- 12.1.12. Interview 2010- August with David Brennan of DCBA
- 12.1.13. Figures in this table are from respective sources e.g. local authorities, or from Truvo phone book data, and cover all four local authority areas.
- 12.1.14. E-mail from Distribution Manager, Group Marcom, Transport for London, 2010- November.
- 12.1.15. Population assessments in London vary depending on source: Borough proper 7,556,900; urban 8,278,251; metropolitan 12,300,000 to 13,945,000.
- 12.1.16. 'Cyclists' assessments of road and traffic conditions: the development of a cyclability index' Transport Research Laboratories (2001) N Guthrie, D G Davies and G Gardner; TRL Report 490. ISSN 0968-4107.
- 12.1.17. Commercial quotations received from three printers in UK and Dublin.
- 12.1.18. Quotation from Ordnance Survey Ireland of 2010- June 19<sup>th</sup>
- 12.1.19. Ordnance Survey Ireland published rates, downloaded 2010- November)

## **13. Appendix 13: Users' Survey**

## 14. **Appendix 14: Users' Survey results**

## **15. Appendix 15: User survey analysis**

## **16. Appendix 16: Cheltenham specification**

Report ends; financial summary presented separately.

## Feasibility study for cycling map of Dublin

Dublin Cycling Campaign

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