

Typical Costs of Cycling Interventions

Interim analysis of Cycle City Ambition schemes



Report to the Department for Transport, January 2017

Ian Taylor and Beth Hiblin

transport for quality of life

Project name:	Monitoring and evaluation of Cycle City Ambition Grants: interim report to Department for Transport compiling typical costs of cycling interventions
Client Reference:	Contract SO17265 between DfT & Technopolis/ Transport for Quality of Life/ Sustrans
Client:	Department for Transport
Date:	15 January 2017
Version:	170115 / Final2 to DfT incorporating amendments from local authorities

Citation

The preferred citation for this report is: Taylor I and Hiblin B (2017) *Typical Costs of Cycling Interventions :Interim analysis of Cycle City Ambition schemes*

Client disclaimer

Should this report be published by the Department for Transport (DfT), the findings and recommendations remain those of the authors and do not necessarily represent the views of the DfT. While these parties have made every effort to ensure the information in this document is accurate, DfT do not guarantee the accuracy, completeness or usefulness of that information, and cannot accept liability for any loss or damages of any kind resulting from reliance on the information or guidance this document contains.

Acknowledgements

Thank you to officers from all the Cycle City Ambition (CCA) projects who kindly provided the cost breakdowns required and took the time to explain exactly what improvements the funds had provided.

Photographs were provided by the project that implemented the scheme under discussion except where otherwise attributed.

Cover photograph: Cambridgeshire County Council

This report was delivered through the BIS Framework by the Technopolis supplier group.

Contact:

Transport for Quality of Life Ltd

T: 01654 781358

E: info@transportforqualityoflife.com

W: <http://www.transportforqualityoflife.com>

Contents

Purpose of this document	3
Methodology	3
Costings:	
Cycle superhighway	4
Mixed strategic cycle route	6
Resurfaced cycle route	8
Cycle bridge	9
20 mph zone	10
Remodelled major junction	11
Cycle crossing at major road	13
Area-wide workplace cycle facilities	14
Area-wide school and college cycle facilities	15
Large-scale cycle parking	17
Large-scale provision of bicycles	18
Comprehensive cycle route signage	19
Automatic cycle counters	19
Summary and Conclusions.....	20
Summary Table: Scheme types and costs	20

Glossary

CCA	Cycle City Ambition grant programme
LSTF	Local Sustainable Transport Fund grant programme

Purpose of this document

This document provides a summary of typical costs of cycling interventions and the factors that affect them, drawn from expenditure during delivery of Phase 1 of the Cycle City Ambition (CCA) programme.

Methodology

A list of representative types of outputs to be costed was compiled from a review of CCA bid documentation, progress reports and other monitoring information. Additional information was requested from each CCA project to explain the breakdown of expenditure and the detail of the resulting outputs. Phone conversations with project staff helped tie down remaining specifics regarding the nature, scale and quality of outputs.

The CCA programme provided capital-only grants. The examples covered in this document therefore concentrate on outputs from capital expenditure. However, encouraging use of cycling facilities installed with capital funds is likely to require revenue expenditure. In general, the CCA projects have in the past also undertaken revenue-funded interventions to encourage cycling. Where a particular CCA capital intervention is known to be closely linked with ongoing revenue expenditure to maximise its use, that link is mentioned, but figures for revenue expenditure are not included in the costing.

Costs quoted are outturn costs wherever possible. Budgeted costs have only been used for schemes where final outturn costs were still awaited and are marked as such.

The costs cited in this document include all capital expenditure on the scheme in question from other sources in addition to the CCA contribution.

Scheme Type: Cycle superhighway

Definition:

An extended cycle route that enables direct, rapid, safe cycle trips largely segregated from traffic along an arterial route e.g. a 10km route following an A-road from outer suburbs to a city centre.

Typical features:

- Physically protected segregation from traffic and pedestrians for much of the route, using kerbs, paving level differences or other physical means.
- Sufficient width to accommodate large flows of cyclists.
- Cyclist priority at side roads with speed tables to slow cars.
- Clearway orders to prevent parking in the cycle lane.
- Cyclist 'bypasses' to the rear of bus stops forming passenger waiting 'islands'.
- Dedicated cycle crossing facilities across major roads, signalised where necessary.
- A feeling of safety so that unconfident cyclists feel comfortable using the route.



Range of unit costs:

Cost per km	Location and description	Local factors affecting cost
£1.45m	Greater Manchester's busiest cycle corridor along Wilmslow/Oxford Road to East Didsbury (5km completed, 2km to follow). 63% fully physically segregated, 1% 'lightly segregated', 28% on-road cycle lane not physically segregated, 8% shared with pedestrians.	Both sides of the road. Several challenging district shopping centres required more costly solutions. Three bus stop bypasses per km, 90% requiring bus stop relocation further into the carriageway, with some reuse of shelters but most receiving new shelters. Five crossings upgraded to Toucans per km. 0.5 brand new Toucan crossings per km. Added cost for night-time working and traffic management on a busy road. Existing highway required repairs in places. Some old signals required cabling re-ducted.
£1.15m	Bradford city centre to Leeds city centre continuing to Seacroft in East Leeds. 23km in total but 32km of physically segregated cycle lane counting one-way sections either side of the road. 2km through Leeds city centre not counted here since it received only minimal interim measures in advance of CCA Phase 2. (Part of route pictured p.5 left.)	Both sides of the road. Over four bus stop islands/bypasses per km, 60% requiring relocation and new shelters. One new and four upgraded road crossings per km (Toucans, Zebras and cycle phases at existing signals). Night-time working and other time restrictions were needed since the route is a major road. Contaminated materials were unexpectedly unearthed. Restricted width in Stanningley Bottom required costly carriageway works to create a shared space road environment.

£0.96m	Cambridge Huntingdon Road (three pictures on p.4). Not 'superhighway' in length (1.6km only) but its role in this smaller city is similar: physically protected segregation for cyclists creating safer and quicker access along a key radial route. One side, one-way only, for inbound peak journeys obstructed by traffic congestion. 2.1m wide uni-directional lane segregated by height (80%) or by a narrow kerbed island (20%). Replaced a 1.4m wide on-road lane. CCA Phase 2 will extend the scheme further to the centre.	Costing is for one side of the road, one direction only. Three bus stop bypasses per km with bus shelters renewed and moved towards carriageway (see middle picture p.4). Design and casting of bespoke 'Cambridge Kerbs' to edge raised sections of lane, with a chamfered profile that allows cyclists (and ambulances) to ride on and off at any point (bottom picture on p.4 shows this and segregation by a narrow island beyond). Inefficient working window of 9.30am-3.30pm to avoid peak traffic. Some footway and carriageway replaced to avoid additional disruption and cost later.
£0.24m (budgeted cost)	Greater Manchester Broughton cycleway linking residential areas in Broughton to Salford Quays and Salford university. Not a 'super-highway' in so far as half is marked lanes only, not physically separated from traffic, and the route only totals 2.2km, but included to show costs of a 'light segregation' approach.	Both sides of road. 'Lightly segregated' with striped 'armadillo' plastic studs and intermittent lightweight plastic 'splitter islands' (two right hand pictures below). Segregation broken at bus stops, junctions and side roads, so 0.9km of route is on-road coloured lanes not physically segregated. Costs were increased by resurfacing the whole road to delay further disruption.



Photo credit © 2016 Google

Key factors influencing cost of delivery:

Cycle superhighway schemes concentrate on providing the most direct routings possible, which generally are already occupied by major roads. To minimise traffic disruption, construction of physically segregated space for cyclists has to be restricted to off-peak periods or overnight, adding costs. A higher degree of physical segregation throughout the route, with wider path widths and fewer compromises at side roads and bus stops, raises the cost, but is better for cyclists. Roads with verge and other roadside space, or where the highway itself can be narrowed, allow cheaper route construction (and better outcomes). Tight environments in older centres with buildings close to the roadside require more complex solutions to negotiate obstacles, and may require costly wholesale street redesign to tame cars and make cycling feel safer.

'Light segregation' may have much lower capital costs. However, it is possible that maintenance costs may turn out higher than for more durable segregation, since light segregation materials can be more susceptible to damage from vehicles (picture, right – but note this is *not* of Broughton cycleway scheme, and Greater Manchester have only had to replace a few broken posts on the splitter islands in the first nine months of the Broughton scheme). Light segregation also feels less secure for cyclists, and the studs themselves may create hazards for cyclists (e.g. in the picture above, the studs are positioned within the cycle lane).



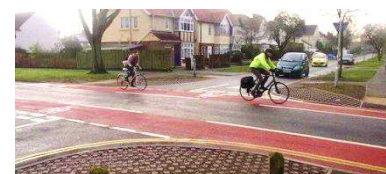
Scheme Type:
Mixed strategic cycle route

Definition:

An extended cycle route to facilitate cycling along a strategic corridor, comprising a mixture of: signed route without dedicated lanes along quieter roads; on-road lanes without physical segregation; physically segregated cycle lanes along busier roads; marked cycle routes away from roads where such alignments are available.

Typical features:

- Continuous clear signage from one end to the other.
- Routing and provision of segregation and crossings so the whole route can be cycled without encountering major obstacles or having to battle with fast traffic on a busy road.
- Deviations from the fastest most direct route to follow parallel quieter roads or paths through parks and green corridors.
- Speed restrictions such as 20mph zones and traffic calming.



Range of unit costs:

Cost per km	Location and description	Local factors affecting cost
£0.88m	Newcastle city centre to beyond Gosforth. A 4.9 km route in total. Assorted works upgrading existing routes and providing new sections to form a continuous higher grade route. Includes widened and resurfaced path across Little Moor green space, traffic calming on minor roads, new and widened cycle route along a major road (Great North Road), signalised crossings and junctions.	Mostly improvement to route already in place rather than brand new route. Works to improve a subway under a major road close to the city centre. Cycle lane lightly segregated with studs for 0.6km either side of the Great North Road, with several bus stops relocated as floating islands to allow cycle bypasses to the rear. Traffic calming where the route passes through a junction on minor roads. Three signalised cycle crossings and two cycle Zebras. Some additional cycle parking provided.

£0.46m	<p>Norwich Pink Pedalway (four pictures on p.6) from the hospital and university in the west across the city via the centre to the northeast of the city. A 9.2km route in total. Mixture of works including: 1.8km new on-road cycle lanes, mostly not physically segregated; 1km new track away from roads; 4 advanced stop areas at signals; 2 new cycle Zebras; 5 other new crossings; speed humps; traffic management alterations; parking alterations; public realm improvements; tree planting.</p>	<p>Route already in place rather than entirely brand new route. About 50% of the route was upgraded. Costs exclude 20mph zones along and around the route. Costs include £184,000 for signage. Conservation area in city centre required special paving material, signs and lighting. Conversion of a key narrow 100m street to become a dedicated two-way cycle street (top picture on p.6) required changes to traffic management across the city centre. Some other central streets were entirely remodelled and improved for cyclists and pedestrians. 1.4km new overhead path lighting, motion-activated through sensitive areas.</p>
--------	--	--

Key factors influencing cost of delivery:

Costs rise with the proportion of the route where physical segregation from traffic is provided. Availability of parallel off-road alignments where trackway can easily be provided reduces costs. In town centre environments with restricted space heavy expenditure may be required on wholesale street redesign. If these centres also have historic value, special design and materials to conserve the historic environment further increase costs.

Scheme Type: Resurfaced cycle route

Definition:

A track resurfaced over a significant distance to create a new strategic cycle route e.g. a towpath improved from rough track to tarmac, so it becomes an everyday cycle commuting option.

Typical features:

- All-weather bonded surfacing.
- Widening to make more path usable by cyclists.
- Associated small-scale improvements along the path to make use more pleasant and safer e.g. signage and information, installation of bike parking, seating, guardrails, and surface-mounted solar stud lights (which only provide very limited ambient lighting but do guide riders and add some feeling of security).
- Associated improvements at access points e.g. improved ramps/steps, or bollards/barriers to stop vehicle access.
- Associated repairs e.g. to boundary walls and fences.



Range of unit costs:

Cost per km	Location and description	Local factors affecting cost
£0.19m	Birmingham towpaths on seven canal routes (47.2km of route in total). Unfinished and crushed limestone surfaces upgraded to bonded surfaces. Widened to 2.5m where space. (Before-and-after pictures above.)	Some sections already had suitable brick surfacing. 2km of city centre canals received information totems, adding £43,000 per km. Costs exclude works for ramped access at two locations (£250,000 and £450,000, the latter narrowing the canal to make space).
£0.18m	Manchester to Ashton-under-Lyme canal towpath (8km). Muddy track only suitable for mountain bikes upgraded to bonded all-weather surface a minimum of 1.8m wide and wider where feasible.	The route was re-signed. No work to accesses was required. The works incorporated 6km of solar stud lighting (picture right).
£0.14m	Leeds-Liverpool canal towpath between Kirkstall and Shipley (16km). Mud, uneven brick and worn surfaces upgraded to bonded all-weather surfaces suitable for all types of cycle.	Associated works included signage, repairs to the wall of the canal itself, and upgrade of barriers to improve access for pedestrians and cyclists whilst excluding vehicles and motorbikes.



Key factors influencing cost of delivery:

Upgrading surfaces from grass and mud is likely to cost much more than upgrading a path already developed for cycling. Signing, lighting and wider paths are desirable but add cost. Significant civil engineering works, to alter a canal or create new and improved accesses with suitable gradients, increase costs sharply. Projects found canals inaccessible, needing work from boats, small machinery, and double handling of materials. Using only the Canal and River Trust's approved contractors reduced scope to tender. A World Heritage Site required use of costly Bath stone.

Scheme Type: Cycle bridge

Definition:

A new or upgraded bridge to enable cyclists to cross a major obstacle e.g. a cycle bridge over a river, railway line or busy dual carriageway road.



Typical features:

- Ramping from both sides at gradients comfortable for cyclists and disabled users.
- Non-slip surfacing material.
- Guard rails of a height sufficient to ensure safety to bicycle riders.
- Lighting.



Range of unit costs:

Cost	Location and description	Local factors affecting cost
£0.50m	Bristol Pooles Wharf (pictures above). Not a brand new bridge – a refurbishment of a pre-existing 30m long bridge that would otherwise have been shut. Gives cyclists a straight run along a major cycle route rather than deviating around a dock. Ramps compliant with disability legislation were installed both sides.	Pre-existing piers and bridge superstructure. The bridge has to open to allow boats through, so the opening mechanism had to be refurbished. The usable area of the bridge was widened by 0.4m to 2.3m by moving the railings. Low-level deck lighting was installed, and non-slip surfacing was laid to the bridge.
£0.10m	Bristol Vauxhall Bridge across the River Avon. Not a new bridge – an addition of a ramp where previously access was stepped and required cyclists to dismount.	The ramp has to provide a large rise (c.5m) because, in addition to crossing the river, the bridge spans a road with clearance for HGVs.

Key factors influencing cost of delivery:

Brand new bridge structures are planned as part of CCA projects but none have so far been completed. Projected costs of these new bridges range from £1m to £5m, covering a range of bridge spans and design specifications. Some bridge projects have been delayed or removed from project plans due to higher than forecast costs, possibly indicating that bridge projects can be difficult to accurately cost. A full range of outturn costings for bridges will be available at the end of the CCA programme.

Scheme Type: 20 mph zone

Definition:

An area-wide scheme to introduce a 20 mph speed limit to make cycling less intimidating along a strategic corridor or throughout an area, backed with physical measures to control traffic speeds.

Typical features:

- 20 mph speed signs.
- Prominent signage and highway treatment at entry points to the zone.
- Traffic calming measures where judged necessary to restrain traffic speeds to 20 mph.
- Additional highway treatment to slow traffic at safety-critical locations, such as school entrances.



Range of unit costs:

Cost per km	Location and description	Local factors affecting cost
£15,000	Norwich (pictures above) city centre and areas either side of the Pink Pedalway to reduce traffic speeds near, across and along that strategic cycle route (48km in total).	Cost includes all highway works to install speed humps, speed cushions, speed tables and pavement build-outs, in addition to signage of the 20 mph zones.
£10,000 (approximation on estimated street km covered)	Leeds and Bradford areas either side of the cycle superhighway through the two cities (CCA funded approximately 80km of expanded 20mph zone).	Cost includes physical traffic calming including speed humps, speed cushions, speed tables and carriageway narrowing, in addition to signage of the 20 mph zones.
£3,000	Cambridge, covering nearly all roads that are not A or B roads (212km in total).	Cost does not cover any physical traffic calming, just signage, 20 mph markings on the highway itself and red road surfacing at entry points to the 20 mph zone.
£2,000	Bristol, covering two areas (246km in total) as part of staged plan for 20mph zones in all Bristol residential areas.	Cost does not cover any physical traffic calming, just speed signs at zone entries, repeater speed signs within zones, 20 mph markings on the highway itself, and signs activated by excessive vehicle speed.

Key factors influencing cost of delivery:

The range of costs cited in the table above is mainly determined by the extent of the physical works to the highway to constrain traffic speeds. Where works to the highway are undertaken to physically slow down traffic cyclists are likely to feel safer, but this adds expense. Projects commented that costs in city centres and other busy road locations were increased by traffic management measures and out-of-hours working required for highway engineering works. Consultations and pilot schemes with residents and road users required significant expenditure on fees.

Scheme Type: Remodelled major junction

Definition:

A large busy road junction that was an obstacle to cycling re-engineered as a junction suitable to a cyclist-friendly route.

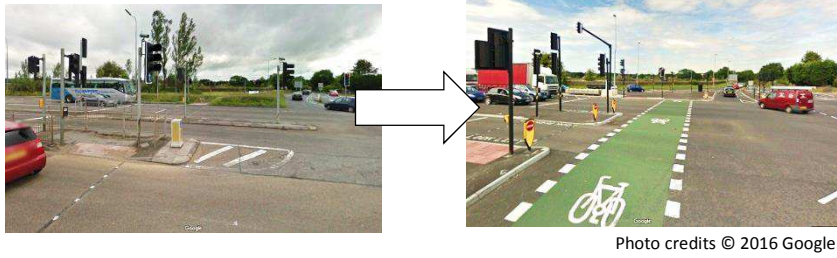
Typical features:

- Highway changes to reduce traffic speeds on approaches to the junction and through the junction.
- Provision of dedicated road space for cyclists with physical segregation where space permits.
- Design changes to make cyclists safer where the main carriageway has to be shared with vehicles.
- Provision of dedicated signalised crossing points for cyclists travelling on physically segregated cycleways.



Range of unit costs:

Cost	Location and description	Local factors affecting cost
£1.61m	Oxford, The Plain Roundabout (pictures above). 5-arm roundabout remodelled to reduce traffic speeds and make cycling safer and less intimidating: all arms given tighter curves, slightly narrowed by widening pedestrian islands, and sloped up to close to pavement level where meet roundabout; roundabout carriageway narrowed and lane markings removed; six unsignalised pedestrian crossings upgraded and kerbs reduced to 50mm.	Breakdown of major costs was: consultation and design £258,000; high spec materials for historic area £403,000 (York stone paving, granite kerbs, stainless steel signs and cycle racks); sub-contractors' equipment and materials £532,000; construction site staff £360,000. Unplanned resurfacing of the roundabout due to pressure to postpone future disruptive works added significant cost. 52 solar studs were incorporated into approach lanes to mark physically unsegregated cycle lanes.
£1.56m (cycling element of £1.9m scheme)	Bristol, Hambrook Junction across the dual carriageway A4174 Avon Ring Road. 15 new and upgraded signalised crossing points including a single fast crossing for cyclists over 6 traffic lanes (pictured overleaf). Sections of cycle path resurfaced and 300m widened to cycle and pedestrian use.	Cost excludes £0.34m paid by Metrobus to ensure the junction was prepared for future bus service developments. Ground works met harder rock than anticipated. Night and weekend working was required to minimise traffic congestion. Utility companies were slow to undertake diversion works.
£0.24m (cycling element of £5m scheme)	Newcastle Cowgate Roundabout re-formed as a signalised junction. No on-road cycle provision; provision was for routes segregated from traffic, some shared with pedestrians. New Toucan crossings on 3 junction arms.	Cost-efficient in so far as cyclists' needs were incorporated in works for general traffic, but required opportunistic prioritisation of a scheme that would otherwise have been undertaken after locations on more strategic routes.



Key factors influencing cost of delivery:

Costs are fundamentally determined by the number and size of the roads forming the junction, the complexity of the junction layout, and the number of strategic cycle route trajectories across the junction that the junction remodelling caters for. Cycle-specific budgets may gain efficient results from piggybacking on plans to remodel junctions for general traffic management. Conversely, a scheme initiated for cycling reasons may rise in cost due to pressure to take the opportunity to resurface the whole junction or improve provision for buses.

Scheme Type:
Cycle crossing at major road

Definition:

A safe crossing point where a cycle route crosses a large busy road that would otherwise be a difficult and dangerous barrier for cyclists.

Typical features:

- Signalised crossing points.
- Separation of cyclist and pedestrian crossing routes where pedestrian and cyclist use is high.
- Changes to the highway to make the crossing point safer.



Photo credits © 2016 Google

Range of unit costs:

Cost	Location and description	Local factors affecting cost
£0.41m	Bristol M32 Junction 1 southbound slip road provided with signalised cyclist-pedestrian crossing where it is crossed by the Cribbs Causeway to Emerson Green cycle route.	A nearby roundabout had to be redesigned to allow for the crossing, entailing removal of a bus lane. Consultation with bus companies about this and with Highways England as statutory authority for motorways and trunk roads delayed the scheme.
£0.14m	Birmingham Bordesley Green East dual carriageway equipped with a two-stage Toucan crossing on the Cole Valley cycle route between the suburbs and the inner city.	Completely new crossing (pictures above) where previously cyclists had to negotiate four lanes of 40mph traffic and a kerbed central island without any crossing facility.
£0.14m	Norwich Inner Ring Road. A new signalised cycle crossing on the Pink Pedalway next to an existing crossing where pedestrians and cyclists came into conflict whilst crossing together.	Minor works to the existing crossing were required to make space for the cycle crossing and to combine the traffic signalling. A two-stage crossing of two carriageways (i.e. two sets of signals).

Key factors influencing cost of delivery:

If the crossing requires works to alter the carriageway, costs are likely to rise sharply. Upgrade of a pre-existing crossing may or may not prove less costly than starting from scratch, depending on the extent of the upgrade and whether the starting situation is comparatively straightforward.

Scheme Type:

Area-wide workplace cycle facilities

Definition:

Cycle facilities at workplaces throughout a project target area, provided by a programme of small grants to employers.

Typical features:

- Capital grants offered to a capped limit to install safe dry cycle parking, clothes drying rooms, lockers, showers, and other on-site facilities.
- May be linked to an employer contribution or commitment to implement a corporate travel plan.
- May be supported by local authority revenue expenditure on activities and services supporting and promoting cycling (e.g. cycle training, cycle maintenance, workplace 'challenge' competitions).



Range of unit costs:

Cost	Location and description	Local factors affecting cost
£0.75m (£6,000 average grant)	Greater Manchester workplace grants to 84 businesses for CCTV security, lockers, drying rooms, cycle hoists and wall mounted cycle racks in cycle rooms. 1,228 cycle parking spaces. LSTF funded to date, to become CCA funded in Phase 2.	Grants capped at £10,000. The cost included 33 grants to registered social landlords that resulted in 593 cycle parking spaces. Employers were required to provide at least 10% cash match funding and at least 50% match funding including any contribution in kind. Over 90% of cycle parking grants provided dry secure spaces.
£0.20m (£7,000 average grant)	Birmingham (pictures above) grants to 27 workplaces, funding cycle shelters, cycle stands, showers, hairdryers, lockers, drying rooms, CCTV security, repair stands, tool kits, bike pump stands, pool bikes, and accessories (including locks, lights, helmets, high-vis clothing, panniers).	Grants capped at £10,000. Initially focused within 20 mins cycle ride of the city centre in CCA Phase 1, rolling out citywide during Phase 2. Match funding from employers was requested but was not essential, and could be given in kind as staff time. Approximately 60% of cycle parking grants provided facilities under cover, and 20% were also lockable or otherwise secured.

Key factors influencing cost of delivery:

This sort of activity starts by setting a fixed budget, so the question of cost control and cost efficiency becomes a question of how to maximise outputs within the budget. If the public expenditure can lever funding from businesses, then more capital investment will be achieved, so long as that stipulation is not at the expense of getting the budget spent. However, match requirements may need to be flexible to allow inclusion of smaller firms' premises and not-for-profit organisations. Value for money should also include consideration of how use of the facilities will be maximised by the employers who receive the grants, so tying the grants to travel planning activity is sensible, although this requires revenue spending for staff and activities to support a corporate travel planning programme.

Scheme Type:
Area-wide school and college cycle facilities

Definition:

Cycle facilities at schools and colleges throughout a project target area, provided by a programme of grants.

Typical features:

- Capital grants up to a set limit to install secure dry cycle and scooter parking, showers, lockers, and other on-site facilities.
- Always supported by local authority revenue expenditure for work with schools to promote and support cycling.
- May be linked to a school’s commitment to run cycling activities and establish a cycling action plan.
- May be associated with a capital budget for councils and schools to jointly audit cycling routes to each school and make highway alterations that help pupils arrive by bike.



Range of unit costs:

Cost	Location and description	Local factors affecting cost
£1.16m (£110,000 per school)	Greater Manchester grants for on-site works up to £100,000 for 11 schools covering 13,000 pupils and 2,000 staff. 834 new cycle parking spaces; 410 upgraded cycle parking spaces; 383 lockers; 2 new mountain-biking cycle tracks; 1 scooter track; 3 cycle workshops; 4 pool bike storage containers; 2 pool bike transporting trailers and tow bars; 2 shower facilities for staff and sixth form students. Off-site work around five schools provided new cycle routes and changed roads to be cycle friendly.	Cost per school raised by the scale of on-site facilities and off-site improvements to cycle routes to five of the schools. Off-site works were £374,000 of the total cost. All cycle parking was under cover and secure. Some schools committed to run activities that were counted as match funding (e.g. cycling as part of physical education lessons, establishing bike clubs, identifying cycle champions and establishing cycling action plans). Transport for Greater Manchester regarded associated revenue funding to be essential (see separate note and costing below).
£0.22m (£8,000 per school)	Birmingham grants of up to £10,000 for 26 schools. The variety of outputs funded included secure cycle and scooter parking (pictures above), showers, workbenches, bikes for staff use, bikes for cycle training, and accessories (locks, lights, helmets, tools).	Approximately 70% of cycle parking grants were for undercover facilities, and 20% were also lockable or otherwise secured. Birmingham commented that this kind of grant scheme also needs a revenue-funded programme of engagement (not included in the costing), which in their case is delivered by an in-house school travel planning team.

Key factors influencing cost of delivery:

The extent of capital expenditure is greatly influenced by whether the budget extends to improving cycle routes to the schools as well as providing grants for on-site improvements. As with workplace grants, cost efficiency for this type of scheme is about maximising outputs within a fixed budget and maximising use of the facilities installed. Many local authorities have now gained years of experience

of work to encourage cycling in schools, from which it is evident that engagement by council staff or by specialist external staff, both requiring revenue funding, does get many more children cycling, but also that keeping cycling levels up after initial engagement requires renewed activity in following years to engage with the new intake of pupils.

Transport for Greater Manchester estimated its associated revenue-funded school activities at £15,000 per school per year (to date funded via LSTF, Transition Fund and Sustrans). This level of expenditure included costs of a full-time officer to work with the schools, a budget for buying bikes and accessories for use with the schools, a budget for the officer to run activities at the schools, and a budget to provide cycle training courses (e.g. bike maintenance, learn to ride, Bikeability, Ride Leader). One of Transport for Greater Manchester's bike maintenance classes and a training session on one of the new mountain bike tracks purchased through the grant scheme are pictured (right).



Scheme Type: Large-scale cycle parking

Definition:

Secure undercover cycle parking to provide sufficient capacity for a major destination e.g. at a town centre or major station.

Typical features:

- Weatherproof design.
- Secure storage with security provided by smart card access or staffing or CCTV or combinations of all three.
- Specialist bike storage systems to maximise capacity.
- Other facilities such as bike pump stands, repair stands, lockers, showers, changing rooms.
- 'Bike shop' services such as repairs and equipment sales may share the site.

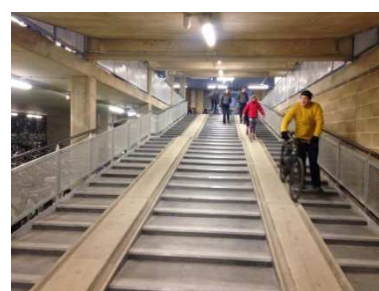


Photo credits Simon MacMichael

Range of unit costs:

Cost	Location and description	Local factors affecting cost
£2.5m (£1.2m for internal cycle-specific works)	Cambridge railway station (pictures above) 24 hr 3,000 bike store on three storeys under new hotel building. Ramped access and double-deck cycle storage racks with dedicated spaces for oversize bikes. Free, with open access. CCTV security only. A bike shop at the site offers repairs and bike hire.	Cost disaggregation from the hotel project is inexact. Commissioned by the train operator Abellio (i.e. the Dutch national railway company) and used as match funding for CCA. The council were involved in the planning. Abellio will manage and maintain the facility and bear the associated ongoing costs.
£0.12-0.20m (standard 'hub') £0.30m (conversion of a station building) £0.40-0.70m ('cycle centre')	Greater Manchester cycle hubs at 15 busy destinations such as central stations. 1,206 cycle parking spaces. Secure swipe-card access and CCTV. (Pictures below). Two 'cycle centres' include showers, changing rooms, lockers, and a bike repair centre.	Funding was provided by LSTF, Northern Rail and local contributions. CCA funding subsequently concentrated on smaller facilities at outlying stations. Size, level of facilities, and site conditions, were key cost determinants. To obtain a swipe-card users pay a £10 per year membership fee.

Key factors influencing cost of delivery:

Major cycle parking facilities require space at busy destinations where space is already in demand. If the local authority owns suitable land or premises this will help constrain costs. Although costs rise with the scale of the facility, economies of scale become available and the viability of associated commercial cycling facilities rises. The nature of the security measures (e.g. staffing, CCTV, or smartcard-controlled access) influences both initial capital costs and ongoing revenue costs.

Public revenue spending for services such as cycle training, cycle maintenance courses and cycling events is in some places associated with staffing a cycle parking facility, and may be combined with commercial activities.



Scheme Type: Large-scale provision of bicycles

Definition:

Provision of a large number of bicycles to encourage cycling amongst a particular target audience.

Typical features:

- Bikes offered free or on cheap loan or hire for target audiences that otherwise may struggle to afford them.
- All necessary extra cycling kit included.
- Offered in conjunction with programmes offering cycle training, bike maintenance, led rides and premises providing a physical focus for cycling within communities.



Range of unit costs:

Cost per bike	Location and description	Local factors affecting cost
£350 (£1.41m total spend for 4,000)	Birmingham (pictures above) 4,000 bikes plus all additional equipment needed to start cycling (helmets, locks, lights, etc). 3,000 bikes distributed free to residents of deprived communities. 1000 bikes used as loan bikes and for use by community cycle 'hubs'.	Budget covers capital cost only. All bicycle recipients were also offered revenue-funded cycle training and cycle maintenance training from 16 community cycle 'hubs'. Bike loans could be long-term or just for a short cycling session. Bikes were fitted with GPS to monitor use.

Key factors influencing cost of delivery:

This type of scheme relies on revenue funding to find suitable users for the bicycles and provide support for those people to make good use of them. In Birmingham this support was provided by community cycle 'hubs' that had been established using previous funding from LSTF and continued with revenue funding from health budgets and local budgets. £0.24m was estimated to be the revenue requirement during CCA Phase 1 (covering two financial years).

Scheme Type:
Comprehensive cycle route signage

Definition:
 Clear thorough signage of a strategic cycle route from end to end so new users can easily find it and follow it.

- Typical features:**
- Clear signs at all junction points.
 - Repeater signs in between junctions.
 - Removal of street clutter that distracts from signage.



Range of unit costs:

Cost per km	Location and description	Local factors affecting cost
£12,000 (£0.18m total spend for two cross-city routes)	Norwich, colour-coded signs along the Pink and Blue Pedalways, covering 9km and 7km of route respectively. (Pictures above of junction sign and a repeater sign.)	163 signs installed. 'Decluttering' removed 232m of guardrail, 56 posts and 113 signs. The Blue Pedalway signage did not cover sections of the route that will be realigned during CCA Phase 2.

Key factors influencing cost of delivery:

Special designs to brand a route, information boards, entry point features and sculptural elements give a route more presence but add cost. Special sign designs for conservation areas also cost more.

Scheme Type:
Automatic cycle counters

Definition:
 Installation of a set of automatic cycle counters to monitor use of a strategic cycle route.

- Typical features:**
- Counters positioned at points where flows on a corridor are channelled together.
 - Counters positioned between each major feed-in point.



Range of unit costs:

Cost each	Location and description	Local factors affecting cost
£6,000 (£0.028m total spend for one cross-city route)	Norwich, five new automatic cycle counters along the 9km Pink Pedalway. Counters are of a type that use detector loops requiring installation by cutting slots in the asphalt.	Budget also covered some manual surveys of cycle use. Automatic cycle counters break down from time to time, so a revenue budget for a maintenance contract is required.

Key factors influencing cost of delivery:

Various technologies are available. Counter units have traditionally been as inconspicuous as possible but there are also counters that combine with totem pole display units to promote the idea of cycling by providing a visible display of the number of people who have cycled past.

Summary and Conclusions

The range of costs for each scheme type is summarised in the table below. Costings are subdivided where two approaches of different quality can be adopted, with different associated costs.

Summary Table: Scheme types and costs

Scheme Type	Range of costs	Range of costs
Cycle Superhighway	£1.15-1.45m/km £0.24m/km	two-way physically segregated two-way lightly segregated
Mixed Strategic Cycle Route	£0.46-0.88m/km	
Resurfaced cycle route	£0.14-0.19m/km	canalside routes
Cycle bridge	£0.10-0.50m	bridge upgrades not whole new bridges
20 mph zone	£10,000-15,000/km £2,000-3,000/km	including traffic calming measures without any traffic calming measures
Remodelled major junction	£1.56-1.61m £0.24m	cycling-specific schemes cycling piggybacking on traffic measures
Cycle crossing at major road	£0.14-0.41m	
Area-wide workplace cycle facilities	£0.20-0.75m £6,000-7,000	programme cost cost per workplace grant
Area-wide school and college cycle facilities	£0.22-1.16m £8,000-110,000	programme cost cost per school
Large-scale cycle parking	£2.5m £0.12-0.70m	for a very large bike park for 3,000 bikes for secure bike parks for 10s - 100+ bikes, including changing and showers at the largest
Large-scale provision of bicycles	£1.41m £350	programme cost cost per bike provided
Comprehensive cycle route signage	£12,000/km	
Automatic cycle counters	£28,000 £6,000	programme cost for one cross-city route cost per counter

The table above draws on examples from Cycle City Ambition Phase 1. It is anticipated that CCA Phase 2 will provide examples to further define the range of costs associated with each type of scheme, and may enable additional scheme types to be costed.