

Metamorphosis Global

Bangladesh Pilot (Phase One)

Developing neighbourhoods in Bangladesh to be more child-friendly, through the illustration of practical case studies and a local-language online toolkit

Milestone 4:

Final Project Report

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Version 2

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Executive Summary

It is the contention of Metamorphosis that the ‘built environment’ can be improved if it is designed with the most vulnerable road users in mind, namely children. This contention is being examined for High Income Countries in the Metamorphosis EU Project in which the University of Southampton (UoS) is a partner. In Metamorphosis Global, the transferability of the concept to Low Income Countries is being examined. This is done through a case study of Bangladesh and a collaboration with Bangladesh University of Engineering and Technology (BUET).

The starting point was a review of interventions related to child-friendly neighbourhoods. This revealed a huge volume of material, particularly focused on High Income Countries. A purposive sample of seven global interventions or groups of interventions was assessed by UoS with respect to four criteria: implementation effort, cost, applicability and empowerment. The best performing interventions seemed to involve road closures and/or some kind of reallocation of road space to cycling, walking or more general recreational activities. Empirical evidence on the impacts of the schemes is generally limited, but there is some evidence of reduced traffic speeds and accidents, which are accompanied by increases in quality of life indicators.

In the development of interventions for Bangladesh, an emphasis was placed on developing local solutions to local problems. In Bangladesh, the number of road traffic fatalities per on-road motor vehicle was over 35 times that of the UK, while the percentage of road traffic fatalities that were children was more than five times higher in Bangladesh than a sample of other countries. As a result, child road safety is a greater issue in Bangladesh than in the UK, and some high-profile incidents have led to this issue being politicised. As result, the Bangladesh case study was focused around two schools: the BUET School in Dhaka, the capital, and Abdul Khaliq High (AKH) in Jagannathpur in North East Bangladesh. In total, these schools have over 2,000 students. Given this contextual background, the seven local interventions drawn-up by BUET had a greater focus on educational initiatives with respect to road safety. Furthermore, road closure schemes were believed to be problematic due to organisational difficulties related to implementation. As a result, a wall painting scheme with an emphasis on road safety signage was believed to be the most appropriate intervention and an eight-week implementation plan has been drawn up.

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Extensive surveys were undertaken at AKH and BUET Schools through preliminary and final workshops involving over 500 participants. These indicated that, in addition to wall painting, there was student support for tree planting, cycling and street closure schemes. A common feature at both schools was the suppressed demand for travel to/from school by bicycle, a feature than can also be found in High Income Countries. In part, this may be because the support for cycling schemes was less strong amongst parents/guardians.

The findings from Metamorphosis Global have been used to develop an online prototype toolkit that has been made available in both English and Bengali. This includes an “Inspiration and Ideas” section, which details the global and local measures that have been reviewed. It also has an “Implementation” section with a focus on end-user scheme development and testing through workshops with children, parents/guardians and road users. The online tool itself has been tested with end users, both internally at UoS and BUET, as well as at AKH School.

In future work, it is hoped to extend the functionality of the online toolkit and include more measures, both for Bangladesh and for other Low Income Countries. This would also include impact evaluations, in addition to the process evaluations that have already been undertaken. The development of appropriate video content is also planned.

1. Introduction

Metamorphosis Global is an IMC Worldwide-funded project on behalf of the Department for International Development (DfID) in the UK, as part of the High Volume Transport (HVT) Applied Research Programme in Transport - Technology Research Innovation for International Development (T-TRIID). It builds on the work of two existing on-going projects at the University of Southampton (UoS): Metamorphosis EU, and the Global Road Safety Research Centre's STARS (Socio-Technical Assessment of Road Safety) Project. The premise of the Metamorphosis EU Project is that the urban environment can be improved if it is designed with the most vulnerable users in mind, namely children¹. Similarly, the STARS Project is demonstrating how socio-technical approaches can improve road safety in Low/Medium Income Countries (L/MICs).

The purpose of this document is to provide a succinct description of the results of the Metamorphosis Global Project. In the rest of this section, the problem that is being considered will be detailed and the aims and objectives of the project outlined. In Section 2, the proposed solutions will be stated, whereas in Section 3 the work conducted to achieve these solutions will be described. In Section 4, the main project findings will be outlined, including the results of surveys conducted at BUET (Bangladesh University of Engineering and Technology) and AKH (Abdul Khalique High) schools. Section 5 discusses the next steps and finally Section 6 will draw some conclusions.

1.1 The Problem

The problem that is being examined by Metamorphosis Global is multi-dimensional. The 'built environment' related to roads in Low and Medium Income Countries (L/MICs) is often of low quality. This is because roads are planned with respect to motorised traffic and relatively little attention is paid to vulnerable road users. This in turn leads to high road accident rates amongst vulnerable road users such as the young, the elderly and persons with restricted mobility. Accident rates are particularly high for pedestrians and cyclists.

¹ See: <https://www.southampton.ac.uk/engineering/research/projects/metamorphosis.page> (Accessed 28 April 2019)

In Bangladesh, the case study country for Metamorphosis Global, there is particular concern over road safety. Police reports for 2015 indicate 2,394 road accidents, involving 2,376 deaths and 1,958 injuries. However, reporting, collection and entry of accident information into the central database maintained by the police is time consuming and, as a result, the official road accident database is not updated frequently. However, accident databases are maintained by the Accident Research Institute (ARI) of Bangladesh University of Engineering and Technology (BUET), as well as by some other non-governmental organisations, based on newspaper reports. For instance, according to ARI, 3,513 accidents occurred in 2018, resulting in 4,076 fatalities and 8,715 injuries, while according to the Passenger Welfare Association, 5,514 accidents occurred, resulting in 7,221 fatalities and 15,466 injuries in 2018². In addition, according to Nirapad Saraka Chai (“We Demand Safer Road”), 3,131 accidents occurred countrywide in 2017, with 5,397 fatalities and 7,736 injuries. Considering the severe under-reporting of police records, the World Health Organisation independently estimated in 2013 road traffic fatalities in Bangladesh of between 17,349 and 25,283 per year. Vulnerable Road Users (VRUs – those not using conventional motorised transport) are the worst affected and account for nearly 80% of road traffic accident fatalities. For example, it was estimated that in Bangladesh, 21% of road traffic fatalities were children, compared to an average of 4% in nine other countries³. It is also estimated that there were over 50 fatalities per 10,000 on-road motor vehicles in Bangladesh, as compared to 1.4 in the UK. The estimated GDP lost due to road traffic crashes in Bangladesh is about 1.6%. Heavy-duty vehicles, such as trucks and buses, including minibuses, are major contributors to road accidents (bus/minibus 33%, trucks 27%) and in fatal accidents their shares are even higher (35% and 29% respectively). This group of vehicles is particularly involved in pedestrian accidents, accounting for about 68% (bus/minibus 38%, trucks 30%). The death of two students in a road accident involving a bus in July 2018 led to nationwide protests and featured in world news outlets.⁴ Further contextual details are given in Deliverable D1.

The focus in Metamorphosis Global is on re-designing neighbourhoods to be more child-friendly in the expectation that this will also reduce road accident rates. However, it is acknowledged that there may be many other types of interventions that could improve road

² See: <https://www.thedailystar.net/city/news/7221-people-killed-road-accident-2018-bjks-report-1692772>

³ Sources: ESCAP, 2006 - <https://www.unescap.org/resources/economic-and-social-survey-asia-and-pacific-2006> and IRTAD, 2005 (International Traffic Safety Data and Analysis Group).

⁴ See: <https://www.bbc.co.uk/news/world-asia-45097650>

safety over and above measures related to the built-environment. Indeed, work in the STARS Project has examined three recent road accidents in Bangladesh and concluded that the introduction and enforcement of regulations concerning driver and vehicle standards would have the potential to lead to large reductions in the frequency and severity of certain types of road traffic accident⁵.

1.2 Aim and Objectives

It is the contention of the Metamorphosis EU Project that streets can be transformed from “ugly bugs” to “beautiful butterflies” by re-designing the built-environment to be child-friendly. Such a transformation should lead to reductions in child accidents, as exemplified by the experience of Bolzano (Italy) since 2001 detailed in section 2.3.

The aim of the Metamorphosis Global Project is to assess the transferability of the Metamorphosis EU concept developed for High Income Countries to L/MICs, such as Bangladesh, and make refinements for local circumstances as required. Taking into account the experience of the STARS Project being led by the UoS, the emphasis is on developing local solutions to local problems. This involves co-creation with local stakeholders through a collaboration with BUET.

The objectives of Metamorphosis Global are therefore to:

1. Undertake a review of Metamorphosis EU type measures as applied in L/MICs.
2. Assess the applicability of these measures to areas in Bangladesh affected by high volumes of traffic using locally collected data on traffic, accidents and street design, using one or more locally ‘worked examples’.
3. Develop an online toolkit, with an emphasis on practical guidance on street closures and play streets around schools.
4. Test and evaluate the online toolkit with end users in Bangladesh, with input from the UK.

⁵ Hamim, O.F., Hoque, M.S., McIlroy, R.C., Plant, K.L., & Stanton, N.A. (under review). Application of a systematic framework for road accident analysis in Bangladesh using Accimaps developed for three case studies. *Safety Science*.

2. Proposed Solutions

2.1 Outline of Concept

Metamorphosis Global will protect vulnerable urban road users in L/MICs by transforming designated urban neighbourhoods from being dominated by car-oriented links to becoming more child-friendly places. The measures initiated by Metamorphosis Global will provide value for money by reducing road accidents, improving the urban environment, stimulating local economic development and enhancing social inclusion, whilst protecting the most vulnerable.

The novel concept comes from the European Commission's Horizon 2020 Project Metamorphosis (<http://metamorphosis-project.eu/>). Building on the work of architect Jan Gehl and the "Copenhagenize" movement (<http://www.copenhagenize.com/>), Metamorphosis EU seeks to redesign urban neighbourhoods from a child's perspective. This is based on the premise that when a neighbourhood has many children in its public spaces, this is a major indicator that it is well designed as a people-oriented and sustainable neighbourhood. Metamorphosis EU is working towards transforming seven European cities from being car-oriented spaces to child/people-oriented places through the creation of vibrant and sustainable neighbourhoods and other public spaces that evoke the vision and creativity of children, and where streets are increasingly used for play and community interaction, rather than solely for traffic to pass through. The deployed schemes help to develop a more inclusive community, with the streets becoming safer and more accessible to everyone, particularly children. In turn, children are particularly effective in promoting innovative neighbourhood designs, as their motivations are built on emotion rather than past logic, and they also work to a smaller and more individual scale, to implement sustainable ideas that can be used effectively by future generations.⁶

Metamorphosis EU is implementing a series of intervention trials to encourage child-friendly

⁶ See: http://metamorphosis-project.eu/sites/default/files/downloads/Metamorphosis_D2.1_v1.1.pdf

neighbourhoods, to show what can be achieved, and is building on the availability of shared space, play streets, living laboratories, crystallisation points and other innovative public space ideas. These trials will safeguard children against vehicles and traffic by providing a safer environment with supervised and unsupervised activities and events. This includes encouraging integrated planning that promotes walking and cycling instead of using the car. It also involves developing innovative approaches to local urban design that engage both children and adults as stakeholders and participants in the co-development and building process, as well as enabling and simplifying city authority procedures for the planning and implementation of child-friendly neighbourhood measures and activities. Some of the key features of child-friendly neighbourhoods are illustrated by Figure 1. The aim of this Project is to globalise the Metamorphosis concept by extending it to L/MICs through a case study of Bangladesh in the first instance.

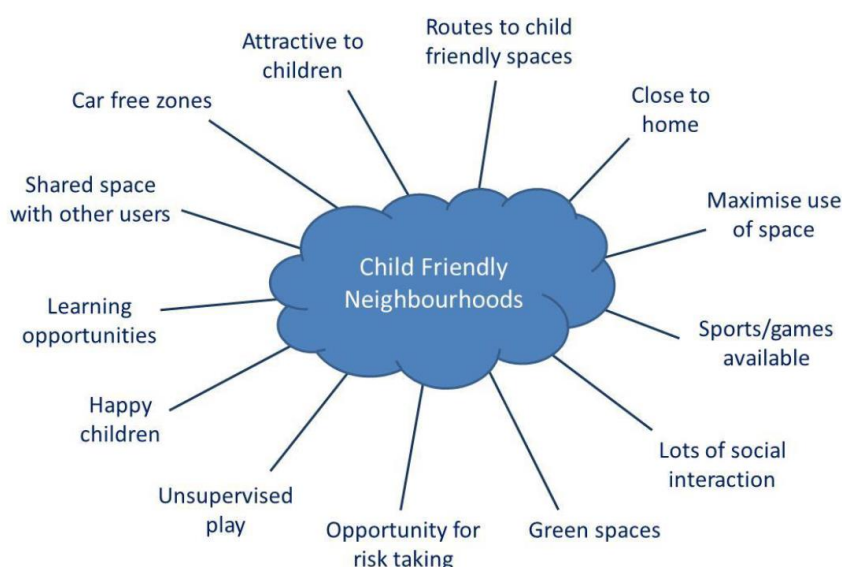


Figure 1: Key Components of Child-Friendly Neighbourhoods

2.2 Ideas Generation

The starting point has been the review that has already been carried out for Metamorphosis EU (Deliverable 2.2).⁷ This reviewed some 45 interventions across five category types, in terms of the effort required, financial cost and applicability. However, as Table 1 shows only

⁷ See: http://metamorphosis-project.eu/sites/default/files/downloads/Metamorphosis_D2.2_v1.1.pdf

in three of these was there any explicit consideration L/MICs, namely “Equal Streets” (Mumbai, India), “Piano Stairs” and “Critical Mass”, with the latter having also a presence in Bangladesh (see: http://criticalmass.wikia.com/wiki/List_of_rides). “Street Smart” is another scheme in India with similarities to Equal Streets that has been identified during the course of Metamorphosis Global, whilst “Ugly Indian” is a further intervention to improve the built environment that has been identified.⁸

Table 1: Number and Location of Metamorphosis Interventions

Type of intervention	EU	Other HIC	L/MIC	Various
Urban Planning	6	4	0	0
Public Spaces	12	2	0	0
Street Closures	6	0	1	0
Sustainable Travel & Exercise	5	0	0	1
Encourage Cycling	7	0	0	1

In Metamorphosis Global, a list of additional measures and interventions has been compiled following a review of the literature by UoS and BUET. This compilation of potential measures and interventions, both as specific proposed case studies in Bangladesh and as existing global case studies, collectively provide a type of ‘best practice’ guide of common or innovative schemes that could help enable the transformation to child-friendly neighbourhoods in L/MICs. These case studies cover a wider spectrum, although typically involve initiatives that (for example):





1. create more vibrant and liveable city spaces for children (and adults) to play and socialise;
2. encourage sustainable travel and reduce motor vehicle use;
3. involve children (and other stakeholders) authentically in the planning, design and/or decision-making process; and/or
4. promote educational initiatives.

This review of the potential measures and interventions can therefore be used by other L/MIC







⁸ See: <http://aproch.org/Home/innerpage/India/INITIATIVES/Street%20Smart> (Accessed 14 December 2018) and <https://www.theuglyindian.com/> (Accessed 28 April 2019).

cities in helping to plan initiatives they could undertake in the future.







Each measure and/or intervention has been given a rating according to four ‘scale of implementation’ criteria that can help cities in their implementation planning. These ratings cover: (i) implementation effort; (ii) costs; (iii) level of applicability; and (iv) empowerment. The first three criteria were defined and applied by Metamorphosis EU. The fourth criterion has been added by Metamorphosis Global, and its focus is on the empowerment of vulnerable road users, namely the young, the elderly and persons with restricted mobility. Empowerment may be either direct, whereby vulnerable road users participate fully in the planning process, or more usually indirect, whereby vulnerable road users are primary beneficiaries of an intervention.

The criteria have been rated on an indicative scale from 1 (lowest) to 3 (highest), with each rating denoted by representative symbols of  (arm muscle),  (money),  (globe) and  (children crossing) respectively, i.e.:


(i) Implementation effort:



-  = *low* (typically individual - less than one person-week);
-   = *medium* (collective - two person-weeks or more);
-    = *high* (wide-scale, and potentially involving several parties - person-months of effort required);

(ii) Costs:




-  = *low* (reflecting effort required, typically none, apart from cost of materials and perhaps volunteer time, or else less than GBP 500 or local currency equivalent);
-   = *medium* (some external or funding by the city or municipal council may be required, typically GBP 500 to GBP 5,000 or equivalent);
-    = *high* (GBP 5,000 or more, and potentially requiring cost-benefit analysis to be conducted beforehand);

(iii) Applicability:

-  = *low* (typically for just a street or less);

-  = *medium* (wider neighbourhood impact or area level);
-  = *high* (potentially citywide application).

(iv) Empowerment:

-  = *low* (little empowerment for vulnerable road users);
-  = *medium* (some empowerment for some vulnerable road users);
-  = *high* (substantial empowerment for most vulnerable road users).

In determining appropriate case studies, the initial intention had been to undertake a systematic review using specified search terms, with a particular focus on the phrase “child-friendly neighbourhoods” and variants thereof. The process adopted is shown in Figure 2 and is based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) format.⁹ A huge number of records were identified from three sources, which from further screening (using the first two pages of each search) was reduced to 689. Removal of duplicates and material that on further investigation was found to be unrelated to the Metamorphosis concept reduced this to 285, whilst application of eligibility criteria reduced this to 89. However, given the resources available for this study, a systematic review of even 89 studies was not possible. Instead, a purposive sample of studies was examined, with a focus on interventions that might be particularly applicable in Bangladesh. These are presented in Table 2 and are more comprehensively described in Deliverable D2.

⁹ See: <http://www.prisma-statement.org/>

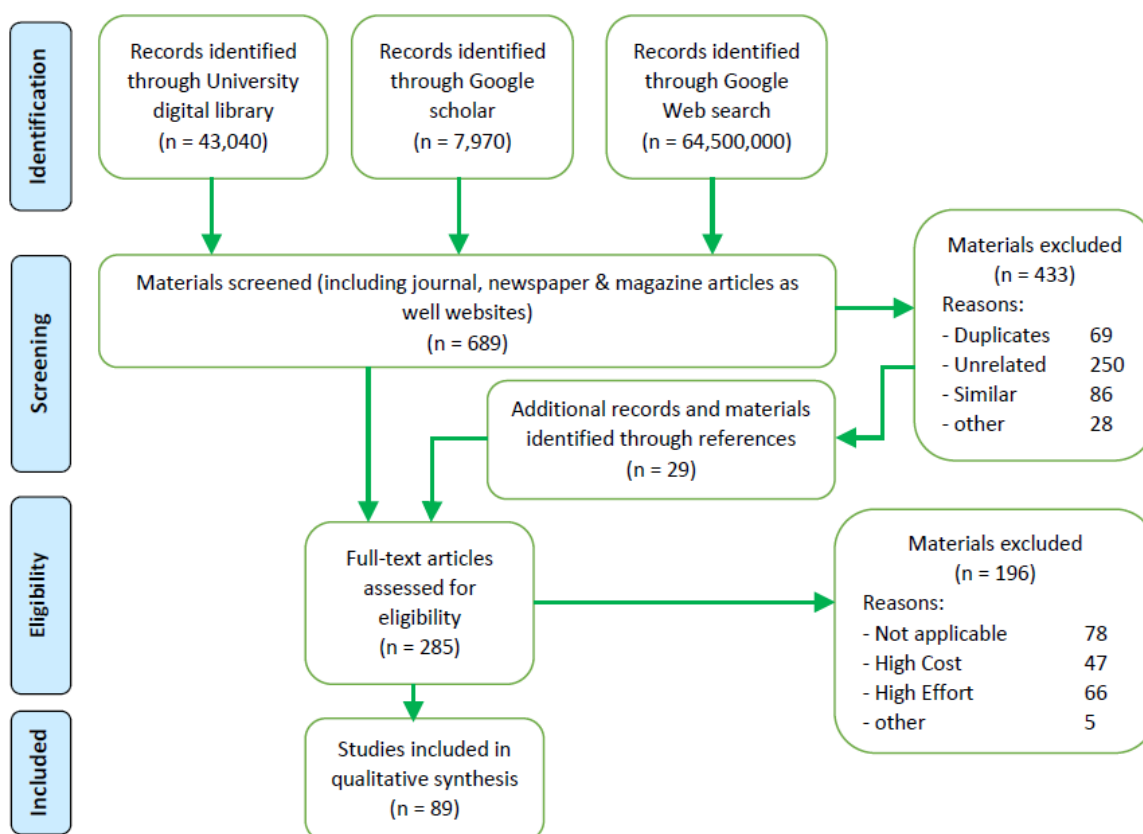


Figure 2: Stages in systematically identifying literature relevant to Metamorphosis Global

Table 2: Purposive Sample of Global Measures

No.	Scheme:	Brief Description:
1.	<i>DIY Protected bike lane using toilet plungers, USA</i>	A group of cycling enthusiasts deployed toilet plungers along an unprotected bike lane in Omaha’s Aksarben neighbourhood to make the street safer for cyclists. This initiative is a bottom-up approach that can also be applied on roads near a school that do not have an elevated or protected footpath for pedestrians.
2.	<i>Colourful crossings, UK</i>	In recent years, pedestrian crossings in cities around the world have been transformed with colourful or unusual designs to improve road safety, create street arts and celebrate special events. Thus, this type of interventions can allow people to engage in social gatherings, as well as to improve road safety.

3.	<i>Singing road rumble strips, Netherlands</i>	Launched by the local government, the asphalt of the highway N357 in Friesland, Netherlands, has a rumble strip pattern on it that plays the Frysian anthem when cars drive over it. As a vehicle accelerates, so does the melody. Similar initiatives can be employed to alert drivers of potential safety hazards in critical areas, such as schools.
4.	<i>Street painting - Sunflower Intersection, USA</i>	In many places around the world, street painting is an event conducted by the local communities to celebrate a special occasion on an annual basis. This type of initiative can bring together the local neighbourhoods including children and adults and permit them to engage in a social gathering with friends and families to reclaim ownership of their public space.
5.	<i>Play Streets, UK</i>	The aim of this intervention is to allow children to reclaim ownership of streets for outdoor activities and to allow them to interact at the neighbourhood level to increase urban children's moderate-to vigorous-intensity physical activity (MVPA) and decrease sedentary time during vacations.
6.	<i>Integrated street design and shared space, UK</i>	Recent developments in the field of urban street design have seen the emergence of the concepts of "integrated street design" and "shared space", which include a range of streetscape treatments aiming at creating a better public realm by asserting the function of streets as places and designing more to a scale aimed at easier pedestrian movement and lower vehicle speeds. This contrasts with the traditional approach, according to which pedestrians and traffic are kept apart through street furniture features, or even grade separation.
7.	<i>Home Zones, UK</i>	The research of Mike Biddulph and others indicates that the introduction of Home Zone design qualities has contributed to improved liveability in established residential streets in a number of areas in the UK. Home Zones can be seen as a precursor to Play Streets.

2.3 Assumptions

One of the key assumptions of Metamorphosis Global is that solutions developed for High Income Countries are not necessarily appropriate for L/MICs. As a result, and consistent with the mantra of “local solutions for local problems”, BUET developed a set of measures shown in Table 3.

Table 3: Proposed Measures for Bangladesh

No.	Scheme:	Brief Description:
1.	<i>Road Safety Mat</i>	The goal of this scheme is to create awareness about road safety issues and to improve the current road environment by making it more child friendly. This mat will be accompanied by other elements, such as toy car/bike, dummy traffic signals and signs. It will be a tool for enjoyment by learning through playing.
2.	<i>Drop and Go Zone</i>	The “Drop and Go” Zone will be a zone where vehicles will stop to drop or collect schoolchildren. The zone will be just beside the street alongside a footpath. The zone will be designed by using the participation of the students of the school (children in junior classes). This will be a place of amusement, as there will be some recreational features as well.
3.	<i>Tree Planting</i>	Every student of the school will be tasked with planting vegetation along the road divider, wherever there is enough space, and they will be responsible for watering and monitoring the growth of the plant. The initiative will be initiated in a festive manner on a holiday with the help of guardians and teachers. A six-monthly token of appreciation will be given to the most enthusiastic planters.
4.	<i>Wall Painting</i>	A segment of the school boundary wall will be selected and students/children from different classes will clean the side facing the main roadway and will then paint pictures portraying road safety issues. Alongside children, their

		guardians and schoolteachers will also be involved in planning and implementation of the scheme.
5.	<i>Owning the Street</i>	A street alongside the school will be closed down for a few hours and will be used for playing by the children and for hosting recreational facilities. It will be a community gathering of different ages, especially by schoolchildren, and will thus be a “merry-making” event.
6.	<i>Hike for Bike</i>	This would promote cycling in and around school campuses. A fixed amount of cycles will be made available to move around anywhere within the campus. A person taking a cycle will use their student ID card (or other ID) for authentication purposes. The programme will be launched through a festival called “Hike for Bike”. A 5 km radius hike undertaken by bicycle will be organised during the launching event, mainly by the children in the campus.
7.	<i>Meet the Street</i>	The street-children and the school-going children will swap their roles for a single day. The schoolchildren will gain an understanding of the street children’s conditions and then there will be entertainment by playing on the streets. Conversely, street-children will get the opportunity to go to school for once and see how classes are run.

Another key assumption is that policy measures should be evidence-based. However, it is clear that such evidence is limited and is often from more general reviews than the specific measures considered. For example, there is evidence that segregated cycle ways have safety benefits [1, 2]. Similarly, a study conducted to estimate the effects of centreline milled rumble strips on rural two-lane roads in Sweden found a reduction of about 20% in the number of fatalities and seriously injured people. Furthermore, the study also found that up to 90% of interviewed road users stated that the rumble strips would help improve traffic safety [3].

Results from the implementation of Integrated Street Design schemes have shown that benefits can be achieved in terms of road safety (e.g. fewer high-severity traffic conflicts, and

so lower accident risk) [4], but also often in terms of mobility efficiency [5]. Most importantly, significant benefits in terms of user behaviour and perceptions can be expected as a result. For instance, research has shown that such interventions increase the confidence of pedestrians in the street and empower them to assert their presence, whereas at the same time, they introduce some level of ambiguity for the drivers, and as a result increase their alertness [6, 7]. With respect to perceptions, studies have confirmed that pedestrians feel more comfortable in streets redesigned with such interventions compared to their pre-redevelopment layouts [8, 9]. Appropriately modified schemes could potentially be relevant for implementation around critical road safety sites, such as schools. Although integrated street design schemes have increased empowerment for vulnerable road users in general, one group that perceives disadvantages is the visually impaired. Technological solutions in terms of navigation aids might be considered here.

A review of 14 Home Zone schemes implemented in the UK between 2002 and 2006 found that although the concept had not been fully implemented in all cases, these schemes exhibited lower traffic speeds and continued low or reduced numbers of traffic accidents compared to conditions before the Home Zones were implemented. Speed surveys were conducted for eight of the schemes, with five exhibiting speed reductions of 5 mph or more. There was information on accident rates for 12 of the schemes, with eight experiencing either no change or a small reduction. In total, for the 12 schemes overall there was found to be 3.4 less accidents per year. Residents reported that they now felt their streets were safer for their children and more attractive than they were previously. Some of those in high crime areas experienced reduced levels of crime and antisocial behaviour, although these results were not obtained everywhere. Evidence that the treatments resulted in more socialising among adults was less convincing, but in general the projects were very well received by residents, demonstrating that this approach to street design improves liveability. Moreover, the evidence suggests that similar effects might be realised with less comprehensive and expensive solutions [10]. Detailed studies of other schemes, such as the Southville scheme in Bristol, found similar results [11]. Before and after surveys found perceived improvements for quality of life factors, such as traffic speeds and pedestrian safety, with residents reporting that they spent more time outside in the street and drove more safely. Speed surveys on the Stackpool Road indicated a 50% reduction in the 85th percentile speeds.

Although there are many initiatives centred on the theme of Metamorphosis to create child-friendly neighbourhoods, it can often be difficult to find evidence for the success of such schemes. This is partly because these initiatives are typically conducted by municipal or city councils, and therefore the results tend to be discussed among local government working groups and associated conferences rather than in the academic literature. Many schemes are also relatively small-scale, so independent research monitoring and evaluation is often not conducted.

Initial quantitative evidence from Metamorphosis EU comes from the long-standing Bolzano (Italy) 'School Streets' intervention scheme, which started in 2001 and involved street closures around eight primary schools [12]. The number of reported accidents around these schools reduced from 18 in 2005 to one incident in 2014. The scheme also resulted in an increase in the number of children cycling to school and using the bus over a six-year period (2008-2014), with a corresponding reduction in car use. The scheme was also said to support the development of children's independence, or 'autonomy of mobility', and contributed to their city knowledge, thereby creating a further basis for the development of eco/sustainable mobility neighbourhoods. Similar schemes are now in operation in many other cities, including London and Southampton in the UK, where street closure periods of 45 minutes to one hour are implemented.
















Hence, of the seven global schemes reviewed, only two (Integrated Street Design and Home Zones) have a substantive body of evidence on quantitative impacts, such as reductions in traffic speeds and road accidents, although as the Bolzano case study shows there is also some limited local evidence on the impact of street closures.

3. Work Conducted

3.1 Advances Made

The evaluative results of the global review are given by Tables 4 and 5.

Table 4: Evaluative Results of the Global Case Studies

No.	Scheme:	Indicative Effort	Cost	Empowerment	Applicability
1.	<i>DIY Protected bike lane using toilet plungers, USA</i>		£		
2.	<i>Colourful crossings, UK</i>		£		
3.	<i>Singing road rumble strips, Netherlands</i>		££		
4.	<i>Street painting - Sunflower Intersection, USA</i>		£		
5.	<i>Play Streets, UK</i>		£		
6.	<i>Integrated street design and shared space, UK</i>		£££		
7.	<i>Home Zones, UK</i>		£££		

In Table 5, the sample of seven schemes in the global review are assessed in terms of creating liveable spaces, encouraging sustainable travel and involving children. The schemes are scored across the four criteria on a scale of 4 to 12, where 4 denotes high effort and costs and low empowerment and applicability, while 12 denotes low effort and costs and high

empowerment and applicability. Bike Lanes and Play Streets score particularly well.

Table 5: Summary of Global Case Studies

Categories	Bike Lane	Colourful Crossing	Rumble Strips	Street Painting	Play Streets	Integrated Street Design	Home Zones
Create Liveable Space	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Encourage Sustainable Transport	✓✓	✓				✓	✓
Involve Children	✓	✓		✓	✓		✓
Overall Score	12	9	6	9	11	7	8

✓✓ = primary focus. ✓ = secondary focus

3.2 Technologies Used

The emphasis in Metamorphosis Global is on using low cost, readily available technologies, and the key development of the project is an online toolkit. Descriptions of the prototype are provided in Metamorphosis Global Deliverables D3 and D4 and this tool has been developed using Wordpress and is hosted by Ionos. Versions in both English and Bengali have been created. The online version is available at <http://metamorphosis-global.org>, although some refinements are ongoing.

An offline version was required, as internet connections are not always reliable, particularly in more remote locations. Investigations have found that Geographical Information Systems for accident mapping or GPS tracking of road users are not yet readily available in Bangladesh, but extensive use is made of Google Maps/Earth including in the design process. It is envisaged that a two-way functionality will be added to the toolkit in future iterations. The site map of the prototype online toolkit is shown in Figure 3, while a wireframe of an

example page is given in Figure 4. A screenshot of the Welcome page (desktop PC version) of the toolkit is given by Figure 5a. Furthermore, in order to address problems with internet connectivity, a mobile phone version of the toolkit, designed to work with 3G, has been developed and is shown by Figure 5b.

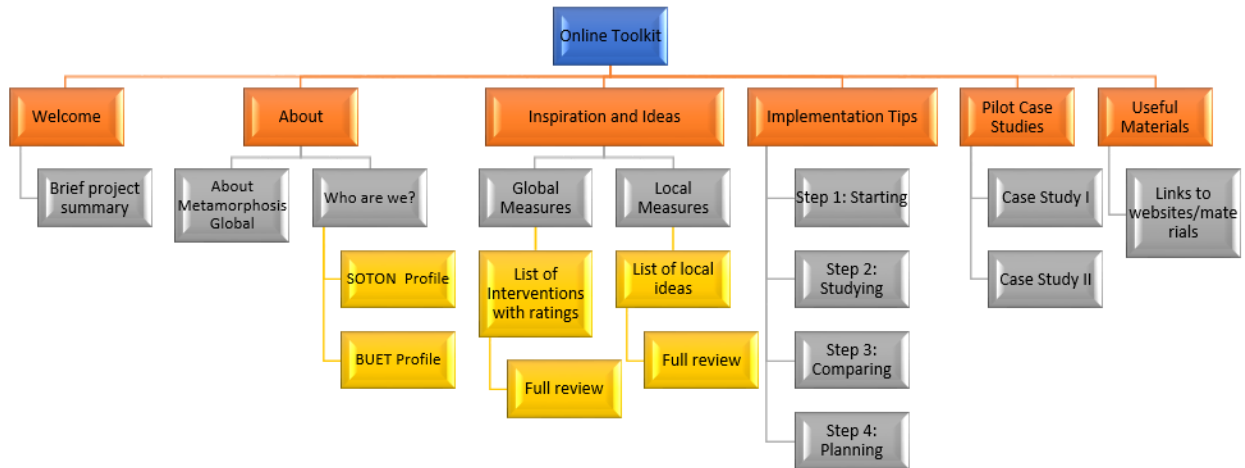


Figure 3: Online toolkit sitemap structure

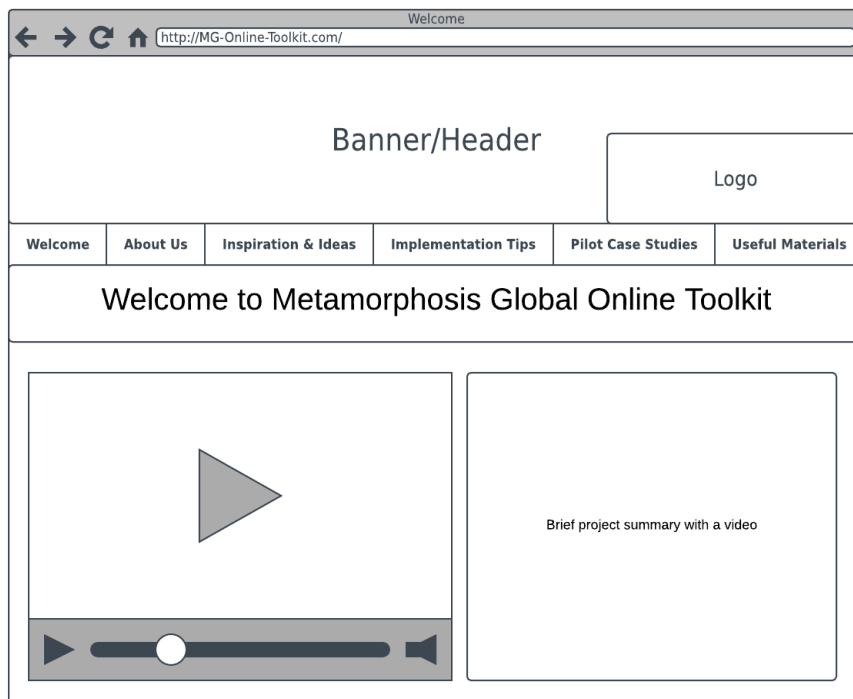


Figure 4: Wireframe of Welcome/home page



Figure 5a: Screenshot of Online Toolkit Welcome Page (PC Desktop version).



Figure 5b: Screenshot of Online Toolkit Welcome Page (Mobile Phone version).

The toolkit has been tested on PCs, tablets and mobile phones with 49 end users at AKH and BUET Schools using the survey form given in Appendix 2. In general, this indicated excellent usability. With respect to accessibility, some concerns were expressed related to the adequacy of text-to-background contrast (5% disagreement), font size and spacing (9% disagreement) and mobile phone friendliness (2% disagreement). In addition, there were some concerns about the main navigation (6% disagreement), the clarity of the navigation labels and major headings (both 2% disagreement), the reasonableness of the number of

buttons (3% disagreement) and the extent to which the page titles are self-explanatory (2% disagreement). There were also concerns with the consistency of the style and colours (2% disagreement) and the appropriateness of the images (2% disagreement). In general, the end users at AKH School were more critical than those at BUET School. However, overall these results were consistent with internal testing performed at UoS and are now being acted upon. Further details are given in Deliverable D4.

Another example of a low-cost, low-technology development is the development by BUET of a road safety mat, as shown by Figure 6. The mat is intended to be a temporary, micro-scale application inspired by permanent macro-scale road safety training facilities in Singapore and the Philippines. Some details of the road safety mat design are given by Table 6. Emphasis would be placed on the use of recyclable and safe materials. Qualitative feedback from parents/guardians at BUET School who attended the Final Workshop indicated strong support for this initiative.



Figure 6: Proposed design of the road safety mat (source: BUET)

Table 6: Road Safety Mat Design Features

○ Dimension	: 10' x 10'	○ Mini Car	: 5 pcs
○ Materials	: PVC (Printed)	○ Mini Bike	: 3 pcs
○ Mini Traffic Signal Stand:	4 pcs	○ Lollipop Signs	: 2 pcs
○ Mini Traffic Sign Stands :	6 pcs	○ Mini House/building	: 10 pcs

3.3 Limitations

A key limitation relates to the availability of consistent sets of road traffic data and road accident data. Details of the two case study sites are given in Appendix 1. However, in the past 10 years there has only been three (fatal) accidents recorded within close proximity to these schools. This is likely to be a gross under-estimate. As a result, monitoring and evaluation of impacts will need to be based on attitudinal data of the type that has been collected at BUET and AKH Schools, and some of this data is described in Section 4.

4. Project Findings

The assessment of the proposed schemes in Bangladesh is given in Table 7 and summarised in Table 8.

Table 7: Appraisal of proposed schemes in Bangladesh.

No.	Scheme:	Indicative Effort	Cost	Empowerment	Applicability
1.	<i>Road Safety Mat</i>	👊👊	££	⚠️⚠️	🌱🌱
2.	<i>Drop and Go Zone</i>	👊👊	££	⚠️⚠️	🌱🌱
3.	<i>Tree Planting</i>	👊👊👊	£££	⚠️⚠️	🌱🌱🌱
4.	<i>Wall Painting</i>	👊👊	£	⚠️⚠️	🌱🌱
5.	<i>Owning the Street</i>	👊👊👊	££	⚠️⚠️⚠️	🌱🌱🌱
6.	<i>Hike for Bike</i>	👊👊👊	££	⚠️⚠️	🌱🌱🌱
7.	<i>Meet the Street</i>	👊👊👊	££	⚠️⚠️	🌱🌱🌱

Table 8: Summary of Bangladesh Applications

Categories	Road Safety Training	Drop & Go Zones	Tree Planting	Wall Painting	Owning the Street	Hike for Bike	Meet the Street
Create Liveable Space	✓	✓✓	✓✓	✓✓	✓✓		
Encourage Sustainable Transport		×			✓	✓✓	
Involve Children	✓	✓	✓	✓	✓	✓	✓
Education Initiative	✓✓						✓✓
Overall Score	8	8	7	9	9	8	8

✓✓ = Primary focus, ✓ = secondary focus, × = possible adverse impact.

As might be expected given a degree of pre-screening, these schemes have similar ratings. The initial view was that an “Owning the Street” scheme might be particularly worth trying, not least given the existence of similar schemes in India. However, links have not yet been forged with the highway authority in Dhaka and hence such schemes may be problematic in terms of implementation. Instead, it was suggested that a wall painting scheme with an emphasis on road safety signage and training might be considered, and an eight-week implementation plan has been drawn up for this purpose.

The results of the desktop reviews were subject to end user testing by undertaking quantitative and qualitative surveys at BUET and AKH Schools as detailed in Table 9 and using survey forms such as those in Appendix 2.

Table 9: Details of Metamorphosis Global Workshops and Surveys in Bangladesh.

Location	Date	Activity	Number of Participants
BUET School	20 March 2019	School Children Survey	121
AKH School	28 March 2019	School Children Survey	113
BUET School	4 April 2019	Stakeholder Workshop	154
BUET School	4 April 2019	Parent/Guardian Survey	41
BUET School	28 April 2019	Online Toolkit Survey	33
AKH School	15 April 2019	Stakeholder Workshop	102
AKH School	15 April 2019	Parent/Guardian Survey	27
AKH School	15 April 2019	Online Toolkit Workshop	55
AKH School	15 April 2019	Online Toolkit Survey	16
BUET School	Various	Road User Survey	30

Note: Stakeholders include neighbourhood watch committees, the police, politicians and local and national media.

The major findings of the hands-up surveys from the students at the two schools were:

- Overall, 65% think that the seven initiatives will make them feel safer travelling to school from a great extent to very great extent (53% at BUET and 78% at AKH).

Final Project Report

- 68% think that the seven initiatives will help to improve the neighbourhood around the school from a great extent to very great extent (55% at BUET and 83% at AKH).
- 80% would prefer to use non-motorised vehicles on their way to school (73% at BUET and 86% at AKH).
- 66% currently feel somewhat unsafe to very unsafe travelling to school (43% at BUET and 90% at AKH).
- 94% currently feel insecure and afraid when travelling to school if the same street is used by buses and trucks (90% at BUET and 97% at AKH).
- 23% are not fully aware of the basic idea of road safety in terms of which side of the road to walk on (46% at BUET but 0% at AKH).
- 23% think that the school entrance is unsafe at peak hours (44% at BUET and 0% at AKH).
- 99% think that schools should have road safety related educational programmes (98% at BUET and 100% at AKH).

In addition, from the surveys with the parents at the two schools, the following results were obtained:

- Overall, 62% would prefer to walk their children to school (45% at BUET and 92% at AKH).
- 52% currently fear trucks the most as a means of transport (40% at BUET and 75% at AKH).
- 21% currently feel at least somewhat unsafe using the streets towards the school (24% at BUET and 17% at AKH).
- 69% currently feel that the neighbourhood around the school is good or very good (76% at BUET and 58% at AKH).
- 80% feel the school entrance is good or very good in terms of safety (76% at BUET and 90% at AKH).
- 100% at both schools think people in the community can play a vital role in making the local neighbourhood more child-friendly
- 100% at both schools feel there should be road safety related lessons or practical in school
- Based on the aggregation of preferences, 18% of parents preferred the “Tree Plantation” scheme for improving the neighbourhood (16% at BUET and 20% at AKH), which was

the best performing of the seven schemes. These preferences were different for road users more generally, where the preferences were 19% for “Wall Painting”, 18% for “Road Safety Mat” and 16% “Hike for Bike”.

- 20% of parents preferred the “Road Safety Mat” for improving road safety (14% at BUET and 28% at AKH), which was the best performing of the seven schemes. These preferences were different for road users more generally, where the preferences were 19% for “Wall Painting”, and 17% for both “Road Safety Mat” and “Hike for Bike”.
- 93% agreed to allow their children to participate voluntarily in implementing a preferred scheme (94% at BUET and 92% at AKH).

Some more detailed results are given in Tables 10 and 11. Table 10 shows that at AKH School, 71% of the students walk to school, with 18% using cycle rickshaw, 7% travelling as a car passenger and only 4% using bicycle. However, 37% of students would like to use the bicycle to travel to school, with those wanting to walk, use auto rickshaw or be a car passenger decreasing to 42%, 8% and 0% respectively. This preference for more independent (and more sustainable) forms of travel to school is also found in studies in High Income Countries [13]. For AKH School, 82% of students felt very unsafe travelling to school, with 24% indicating that the quality of the neighbourhood around the school was very bad.

Not surprisingly given its metropolitan location and the socio-economic status of its catchment area, modal splits are somewhat different for journeys to BUET School. Walking remains the most popular choice, accounting for 39% of students, followed by cycle rickshaw (33%) and car passenger (13%), Further, 8% travel on motorbike, 5% on bicycle and 1% each by bus and by auto rickshaw. In terms of preferred forms of travel, walking tops the list at 38%, followed by bicycle (23%), cycle rickshaw (17%), car passenger (10%) and motorbike (8%). Again, a preference towards more independent (and sustainable) travel is evident, particularly with respect to travelling by bicycle, which in turn has implications for urban design. For BUET School, only 6% of students felt very unsafe travelling to school, although 37% felt somewhat unsafe. Similarly, only 2% indicated that the quality of the neighbourhood around the school was very bad, with 7% indicating that it was bad.

Table 10: Means of Travel to School (%)

	Walk	Bicycle	Motor bike	Bus	Car Passenger	Cycle Rickshaw	Auto Rickshaw	Other
AKH Actual	71	4	1	0	7	18	0	0
AKH Prefer	42	37	4	6	0	8	4	0
BUET Actual	39	5	8	1	13	33	1	0
BUET Prefer	38	23	8	0	10	17	1	3

With respect to the extent that interventions are perceived by students as improving the neighbourhood around their school, Table 11 shows that there are uniformly higher positive scores at AKH School compared to BUET. This might reflect the more negative attitudes towards the current state of the neighbourhood around AKH School. At AKH, the top three schemes as far as the students are concerned are Hike for Bike, Wall Painting and Tree Planting. This is, again, indicative of a latent demand for bicycle travel. At BUET, the top three schemes are Tree Planting, Owning the Street and Hike for Bike. As well as confirming the desire to use bicycles, this also indicates that schoolchildren perceive less practical issues with street closures than adults.

Table 11 also shows that the parent preferences at BUET are quite different from those of the students, with Tree Planting, Owning the Street and Road Safety Mat being the three most preferred options, and with Hike for Bike being the least preferred.

Table 11: Extent Interventions Can Improve Local Neighbourhoods (% responding great extent or very great extent).

	Road Safety Mat	Drop & Go Zone	Tree Planting	Wall Painting	Owning the Street	Hike for Bike	Meet the Street
AKH S	78	58	88	95	87	100	87
BUET S	44	35	76	47	71	60	56
BUET P	52	41	69	41	55	31	36

S = Student

P = Parent/Guardian

It is believed that the two-phase workshop process developed by BUET, in conjunction with local stakeholders, has been instrumental in delivering the objectives of Metamorphosis Global and this process is outlined in Figure 7a (Preliminary Workshop) and Figure 7b (Final Workshop). A key part of this process was to include specialist teachers including those taking drawing and drill classes and to use out of school groups such as the Boy Scouts and Girl Guides. Another feature was the use of PowerPoint presentations of the preliminary workshop results to inform the final workshop.

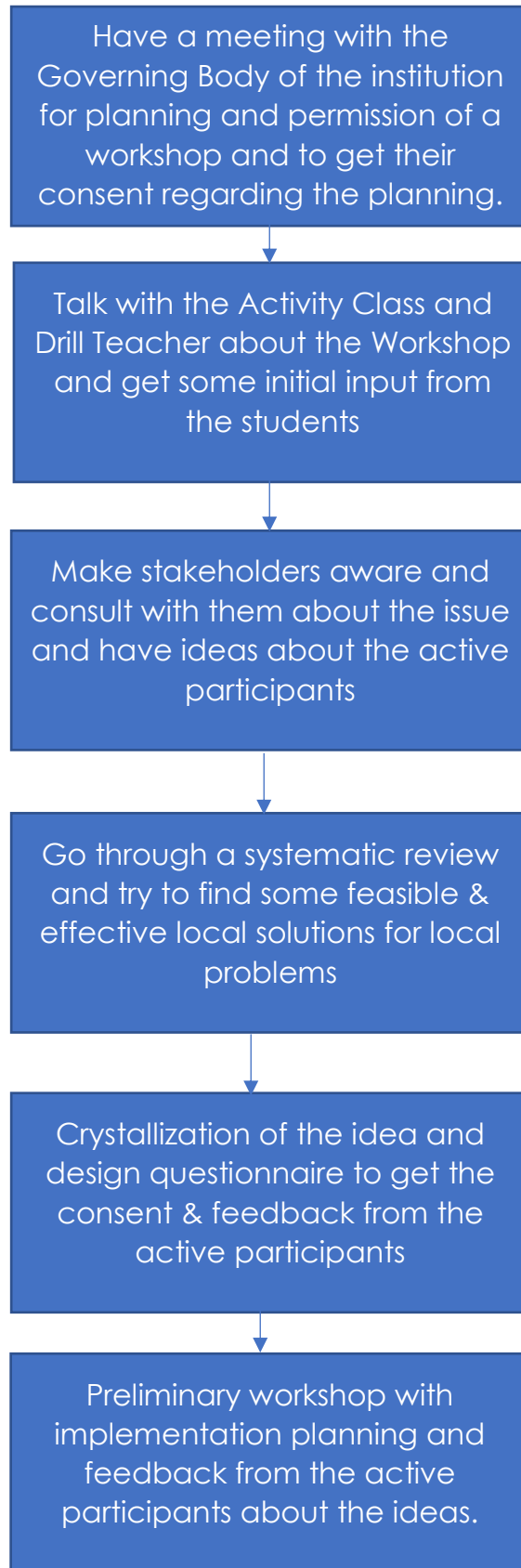


Figure 7(a): Metamorphosis Global Workshop Process – Preliminary Workshop

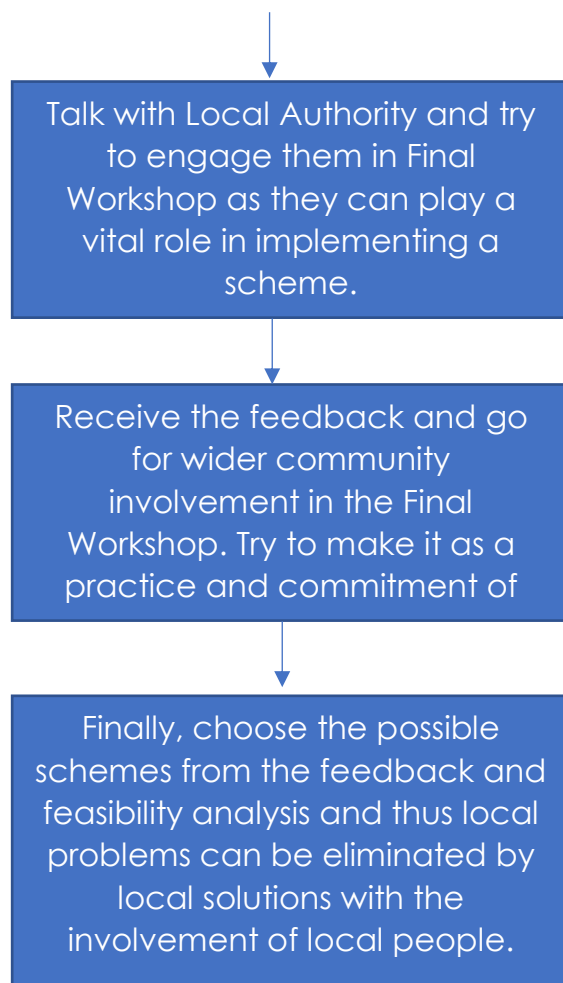


Figure 7(b): Metamorphosis Global Workshop Process –Final Workshop

A good example of effective stakeholder engagement was with the drawing teacher at BUET School. Initially, she was not aware of road safety and she did not think that she could contribute a lot by engaging students in drawing classes. However, after a couple of formal and informal discussions with members of the Metamorphosis Global team and seeing relevant school-based case studies of other countries, she realised that in promoting road safety and a child-friendly environment, she can have a positive impact. In her own words, *“I became overwhelmed when I saw the grim statistics of road induced fatalities and its trend particularly in lower income countries like Bangladesh and as well as knowing different effective community based initiatives involving students”*. She realised that she could also gainfully use her drawing classes to involve her students in road safety campaigns and urban design exercises.

One of the key lessons stressed in the online tool is that partnerships with different organisations across different sectors are a necessary pre-cursor for interventions to be implemented. In particular, links with the traffic police and the highways authority should be established at an early stage, particularly if street closures are to be considered.¹⁰ Early engagement with stakeholders is also a feature of the Metamorphosis Global workshop process illustrated by Figure 7.

¹⁰ See: <http://metamorphosis-global.org/implementation-tips/>

5. Next Steps

5.1 Further Testing and Development

On 18 April 2019, there was a meeting in Bangladesh organised by SROTA (Safe Roads and Transport Alliance) coordinated by the Power and Participation Research Centre (PPRC)¹¹. SROTA is comprised of seven road safety related NGOs and is planning to develop similar school-based safety initiatives among 100 schools of Bangladesh. They have requested access to the activities and toolkit of the Metamorphosis Global Project so that they can actively participate in the testing and development of this approach. It is anticipated that this Alliance will establish links with the relevant highways authorities and traffic police given the importance of this type of engagement. BUET are intending to monitor the progress of SROTA and this work may form a part of any future funding bids.

5.2 Implementation

Prior to testing, BUET had drawn up an implementation plan for the wall painting scheme that will have a duration of eight weeks. Work with the schools has been affected by holiday and exam periods and limitations placed on extra-curricular activities but further activities are being planned at both AKH and BUET Schools.

UoS are continuing to develop the online toolkit. To help L/MICs further develop ideas for child-friendly neighbourhoods, the toolkit has encompassed summaries of other guides, including tried-and-tested interventions, as well as play and child development toolkits that have been uncovered through both Metamorphosis EU and this project. [14-25]. This section of the toolkit will be expanded as the Metamorphosis EU Project evolves (planned to be completed in mid-2020). UoS are also committed to funding the external hosting of the website for at least three years. It is intended that the toolkit will develop two-way functionality and a wide range of other future developments as proposed in section 4.3 of Deliverable 4. These proposed developments will form the basis of future funding bids, either from programmes funded by the Department for International Development or from other sources.

¹¹ <http://www.pprc-bd.org/> (Accessed 28 April 2019)

5.3 Dissemination of Findings

A webinar, developed by Breda University for Metamorphosis EU, has been used to help inform and educate members of the project team from Southampton and BUET, such that they were able to deliver the other components of the project as described in this report.

Details of the specific findings from the Bangladesh local trials will be disseminated through the usual academic channels, including conference papers and articles as appropriate, and where they are judged to be sufficiently interesting from an innovation or technical perspective. As originally planned, it is expected that at least one conference paper or journal article will be published following the completion of this project. These will be produced jointly by BUET and UoS. Links are being developed with Special Interest Group H5 of the World Conference on Transport Research Society that covers Urban Transport in Developing Countries. The International Journal of Sustainable Urban Development is being targeted as an appropriate academic journal, although other titles, such as Sustainability, are possible. These publications plans will be developed in consultation with High Volume Transport programme.

In addition, UoS intends to produce a series of short videos, around three minutes in length, to educate and inform the wider public on the research relating to child-friendly neighbourhoods and future cities, a small number of which will also describe the work relating to the Metamorphosis Global Project. It should be noted that this activity is outside the scope of the original Bangladesh Pilot (Phase One) as proposed to IMC - and is included here only for completeness.

6. Conclusions

It is the contention of the Metamorphosis EU Project that streets can be transformed by re-designing the built-environment to be child-friendly. The aim of the Metamorphosis Global Project is to assess the transferability of the Metamorphosis EU concept developed for High Income Countries to L/MICs, using Bangladesh as a case study, and make refinements for local circumstances as required. Taking into account the experience of the STARS Project being led by UoS, the emphasis is on developing local solutions to local problems. This involved co-creation with local stakeholders through a collaboration between UoS and BUET.

The objectives of Metamorphosis Global were four-fold and they are discussed below, along with the results achieved to date.

1. Undertake a review of Metamorphosis EU type measures as applied in L/MICs. A review using search terms related to child-friendly neighbourhoods revealed a huge volume of material. As a result, a purposive sample of seven interventions, or groups of interventions, was reviewed by UoS. Based on four assessment criteria, it was believed that interventions related to cycle lanes and play streets could be most effective.

2. Assess the applicability of these measures to areas in Bangladesh affected by high volumes of traffic using locally collected data on traffic, accidents and street design, using one or more locally 'worked examples'.

Although there was a lack of local data, national data for Bangladesh indicated that the number of road traffic fatalities per on-road motor vehicle was over 35 times that of the UK, whilst the percentage of road traffic fatalities that were children was more than five times higher in Bangladesh than a sample of other countries. As a result, child road safety was the dominant policy issue and the seven local measures developed by BUET had a strong emphasis on road safety education initiatives. Given this contextual background, the Wall Painting scheme with an emphasis on road safety signage was believed to be the most appropriate neighbourhood improvement intervention and an eight weeks implementation plan has been drawn up. Extensive surveys were undertaken at AKH and BUET Schools, and

the results indicated that in addition to Wall Painting, there was student support for Tree Planting, Hike for Bike and Owing the Street. As a safety improvement measure, the Road Safety Mat had the most parental support. A common feature at both schools was the suppressed demand for travel to/from school by bicycles, a feature than can also be found in High Income Countries. Further interventions are being considered at both schools.

3. Develop an online toolkit, with an emphasis on practical guidance on street closures and play streets around schools.

An online toolkit has been developed in both English and Bengali. The key sections are related to Inspiration and Ideas, in which relevant global and local measures are reviewed, and to Implementation Tips which build on the workshop process developed in this Project. This toolkit will be used by a further 100 schools in Bangladesh, in addition to the two case study schools.

4. Test and evaluate the online toolkit with end users in Bangladesh.

Initial development and testing was carried out by UoS. This was then followed up by workshops with end users at both the BUET and AKH schools that have informed the design of the toolkit. Specific online testing of the toolkit has also been carried out and the findings are currently being implemented.

Future work will extend the functionality of the online toolkit to provide two-way interactions and it would include more measures, both for Bangladesh and for other Low Income Countries. Over a longer scale, this would also include impact evaluations, in addition to the process evaluations that have already been undertaken. Appropriate video content would also be incorporated.

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Metamorphosis Global Deliverables.


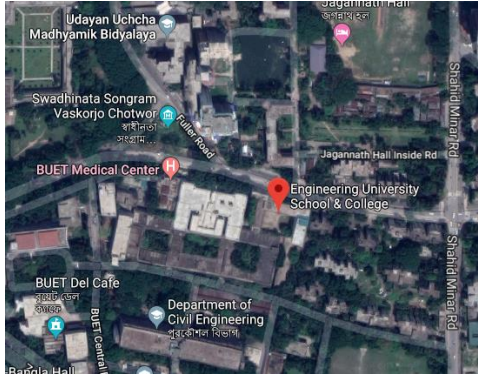
D1 Project Inception Document. October 2018.

D2 Global Case Study Reviews and Report on Bangladesh. February 2019.

D3 Online Toolkit Prototype. March 2019.

D4 Online Toolkit – End-User Tested. May 2019.

Appendix 1: Case Study Schools

Engineering University School and College (BUET School)			
	<p>Engineering University School and College is situated in the campus of Bangladesh University of Engineering and Technology (BUET) under the Police Station of Ramna in Dhaka city, Capital of Bangladesh. The school was established in 1981 and at present there are 1691 students from KG to XII class, 13 classes and 28 sections and the number of students in each section is 60 on average and age range from 4.5 to 18 years old. It is a co-educational institution and has 51 teachers, 33 male and 18 female.</p>		
	<p>Inauguration: 15.03.1981</p>	<p>Total Pupils: 1,691</p>	<p>Age Range: 4.5-18</p>
	<p>Boys/Girls Ratio: 1193 : 498</p>	<p>Average Class Size: 60</p>	<p>Average Attendance: 93%</p>
	<p>Teachers: 51</p>	<p>Male/Female Ratio: 33 : 18</p>	<p>Location: BUET campus, BUET P.O: Ramna Dhaka-1000</p>

Abdul Khalique High School



Jagannathpur is an Upazila situated in the south-eastern corner of the district of Sunamganj and in the middle of the division of Sylhet, which is in northeast of Bangladesh.

Abdul Khalique High School is located in the centre of Jagannathpur bazar and the main entrance to the school is situated on a busy highway (R241). The school was established in 2001 and presently, it has a total of 378 pupils, age ranging from 11 to 19 years old. It is a mixed school and has 10 teachers - 8 male and 2 female and has an average of 76 students per class.

Inauguration:	Total Pupils:	Age Range:
12/02/2001	378	11-19
Boys/Girls Ratio:	Average Class Size:	Average Attendance:
49/51	76	86%
Teachers:	Male/Female Ratio:	Location:
5	8/2	Jagannathpur, Sylhet

Appendix 2: Examples of Surveys Used in End User Workshops

Instructions to complete this survey form:

1. Visit <http://metamorphosis-global.org/>
2. Evaluate the usability of the Online Toolkit on different devices
3. Fill in the boxes on the right and then rate each statement below

Date	User Type (i.e. parent)
Location	

Metamorphosis Global Online Toolkit



		<i>Please rate each statement on a 1 (strongly disagree) to 5 (strongly agree) scale.</i>				
		Strongly Disagree 1	2	3	4	Strongly Agree 5
Accessibility	1. The Online Toolkit load-time is reasonable					
	2. There is adequate text-to-background contrast					
	3. The font size/spacing is easy to read					
	4. The Online Toolkit is mobile-friendly					
	5. The Online Toolkit is tablet-friendly					
Navigation	6. The main navigation is easily identifiable					
	7. The navigation labels are clear and concise					
	8. The number of buttons/links is reasonable					
	9. The links are consistent and easy to identify					
Content/Layout	10. It is easy to navigate within the Online Toolkit					
	11. The page titles are self-explanatory					
	12. The major headings are clear and descriptive					
	13. The styles and colours are consistent					
	14. Images/multimedia are appropriately placed and helpful to understand the content of the page					
	15. The Bangla translation of the Online Toolkit is adequate					



Thank you for taking the time to complete this survey.



Instructions to complete this survey form:

1. Gather the children in a room/place.
2. Count the total number of boys and girls in the room.
3. Fill in the boxes on the right.
4. Ask them each question in this questionnaire separately.
5. Tell them each option separately and ask them to put their hands up if they agree with the option.
6. Count the number of hands-up for boys and girls separately and write the numbers in the appropriate column and row.



Class	Age Group
No. of Boys	No. of Girls

1. How did you get to school today?	Boys:	Girls:
1.1. Walk – with parent/guardian		
1.2. Walk – without parent/guardian		
1.3. Bicycle		
1.4. Motorbike		
1.5. Bus		
1.6. Car Passenger		
1.7. Cycle Rickshaw		
1.8. Auto Rickshaw (including CNG)		
1.9. Other (Please specify)		

2. How would you have liked to travel to school today?	Boys:	Girls:
2.1. Walk – with parent/guardian		
2.2. Walk – without parent/guardian		
2.3. Bicycle		
2.4. Motorbike		
2.5. Bus		
2.6. Car Passenger		
2.7. Cycle Rickshaw		
2.8. Auto Rickshaw (including CNG)		
2.9. Other (Please specify)		

3. How safe did you feel about travelling to school today?	Boys:	Girls:
3.1. Very Unsafe		
3.2. Somewhat Unsafe		
3.3. Neither Safe nor Unsafe		
3.4. Somewhat Safe		
3.5. Very Safe		



Instructions to complete this survey form:

1. This form is designed to be filled in by parents/guardians of the children.
2. Age, gender and occupation of the parents/guardians should be filled in the appropriate boxes on the right.



Age	Gender
Occupation	

1. What form of transport do you use to take your child to school?									✓
Bicycle	Cycle Rickshaw	Walking	Auto Rickshaw (CNG)	Motorbike	Car	Bus	Truck	Other	

2. What form of transport do you fear the most?									✓
Bicycle	Cycle Rickshaw	Walking	Auto Rickshaw (CNG)	Motorbike	Car	Bus	Truck	Other	

3. How would you have liked to travel to school today?									✓
Bicycle	Cycle Rickshaw	Walking	Auto Rickshaw (CNG)	Motorbike	Car	Bus	Truck	Other	

4. How safe did you feel about travelling to school using your route?					✓
Very Unsafe	Somewhat Unsafe	Neither Safe nor Unsafe	Somewhat Safe	Very Safe	

5. How would you rate the quality of the local neighbourhood around your child's school?					✓
Very Bad	Bad	Neither Good nor Bad	Good	Very Good	

6. How would you rate the entrances around the school during the peak hours in terms of safety?					✓
Very Bad	Bad	Neither Good nor Bad	Good	Very Good	

7. Do you think people in the community can play a vital role in making the local neighbourhood more child friendly?				Yes	No		✓



Instructions to complete this survey form:

1. This questionnaire to be filled in by adult road users (drivers).
2. Teachers and parents/guardians of the children to be involved in this activity and they should assist the interviewee to complete this questionnaire.
3. Date, time and location of interview should be recorded in the appropriate boxes on the right.



Date

Time

location of interview

1. What is the purpose of your journey?							✓
Business	Commuting	Education: Own	Education: Escorting Children	Leisure	Shopping	Other	

2. What form of transport are you using?									✓
Bicycle	Cycle Rickshaw	Walking	Auto Rickshaw	Motorbike	Car	Bus	Truck	Other	

3. What often have made this journey in the last year?						✓
5 times a week or more	2-4 times a week	Once a week	1 – 3 times a month	Less than once a month	Never	

4. Are you aware that this road passes a school?	Yes	No	✓
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5. Do you pay extra attention when you pass a school zone?	Yes	No	✓
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6. Have you been involved in any accidents in the past?	Yes	No	✓
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7. Why do you think some drivers flee the accident scene immediately?	✓
7.1. Drivers want to avoid sudden public attack	
7.2. Drivers want to avoid police	
7.3. Drivers have absence of human feeling	
7.4. Drivers think it is not their duty to stop and help accident victim	

8. What is your opinion regarding pedestrians' behaviour in crossing roads?	✓
8.1. Pedestrians know how to cross the road, but they do not follow the rules	
8.2. Pedestrians know how to cross the road and they follow the rules properly	
8.3. Pedestrians do not use the designated crossing and they run across the road	

