

Technical brief



In response to the COVID-19 pandemic, universal access to public handwashing facilities is one of the essential priorities to reduce transmission of the virus and effectively promote hygiene behaviour. WaterAid has been working with governments and other organisations to comprehensively install handwashing facilities in public places and buildings, including markets, public transport hubs, public/communal toilets, and structures such as healthcare facilities and schools, restaurants, places of worship, commercial and public offices.

However, the challenges regarding the protection, and operation and maintenance (O&M) of handwashing devices have triggered the rethinking of new design and the operation modalities to address the renewed interest and ensure the continuity and sustainability of handwashing devices.

As a result, WaterAid Bangladesh as a joint venture with Dhaka Water Supply and Sewerage Authority (DWASA) has introduced a window dressing solution 'Handwashing on Wheel' - a mobile handwashing device to supplant the stated setbacks. It is allowing people to wash their hands at public places free of cost and the current funding has been offered by the embassy of Sweden,

DWASA and WaterAid jointly. This technical brief focuses mainly on the technical design and associated information related to installation, and it's O&M

Handwashing on wheels

'Handwashing on Wheels' is a mobile unit carrying water, soap, and other essential components of a handwashing facility. This amenity can be parked at any convenient location of a public place around the city, town or bazaar to enable good hand hygiene practice among citizens and disseminate hygiene message in different ways e.g. audio, video, and/or written. The extended connective-wastewater pipe connected with the wash basin can be laid out temporarily to the nearby drainage facility and the handwashing station can be put into use to allow people to wash their hands. To trigger handwashing instances, the Tab attached on top of the wash basins continuously demonstrates how to wash the hands properly. Moreover, the interactive digital AV system in the unit plays promotional awareness contents with life-saving hygiene messages, and work as a self-promoting facility to welcome user to wash their hands.

An innovative approach:



- The unit is unique in design, which addresses the challenges of fixed station with swift, friendly and inclusive facilities to access to handwashing.
- It is designed to roam across the crowded place to serve a large number of population.
- Attractive design and inclusive nature makes it usable by children, and differently abled people.
- It ensures adequate flow rate of water, allowing both hands to be washed at the same time and rubbed together. Hence, avoids splashing and provide good wastewater management.
- The interactive AV system equipped with engaging contents motivate handwashing while creating a sustained behavioural change for users.
- Awareness component makes it more visible and draw attention in large set ups, with digital Tab and promotional audio and video messages.
- This amenity is made of readily available local materials, which makes it easily repairable. The response time for any fix so far as reported is 3-4 hours.
- A dedicated person for each device known as 'Unit Operator and Hygiene Promoter' is recommended to ensure regular O&M of the devices and continuous service to the people.
- The simple O&M modality lowers the risk of theft of devices and misuse of soap, and water. Also ensures sustainability of this initiative.

Design and installation:

It is a lucrative yet straightforward design of a mobile handwashing device. All necessary components of a handwashing device are integrated with a non-motorized three-wheeler (motorized three-wheeler can also be introduced depending on the context and budget).





A sample checklist is provided below to understand the particular public location requirements before designing the 'Handwashing on Wheels'.

- What are the strategic locations where these handwashing facilities should be placed to encourage the users?
- What are the particular design requirements for that location? (According to the location, the size of the water tank, number of basins, or wastewater management system are likely to be different).
- How many users are expected? (Plan accordingly to ensure that handwashing facilities do not become crowded and act as 'COVID-19 hotspots').
- Is there any piped water supply available? What are the alternative sources?

What are the local administrative procedures to let such unit roam around?

Materials and specifications

Particulars	Specification	Size	Qty
Water Tank	300 Litre D-2.6'; H-3.08' & MH-1.3'	300 L	1
Basin	Stainless steel sink	Medium	3
Water tap	Stainless steel bibcock	Medium	3
Right and left side cover & branding	Wooden board structure with inkjet print and matt lamination	43"x39"	2
Back side cover and branding	Wooden board structure with inkjet print and matt lamination	39"x44"	1
Front side cover and branding	Wooden board structure with inkjet print and matt lamination	39"x44"	1
Upper side cover (with a hole for opening tank cover)	Wooden board structure with inkjet print	43"x44"	1
Speaker box	Wooden board structure with inkjet print	39"x12"x20"	1

Materials and specifications

Wheel cover (left & right)	Wooden board structure with inkjet print and matt lamination	69"x16"	2
Wheel cover (front & back)	Wooden board structure with inkjet print and matt lamination	48"x16"	2
Left side shade	Iron structure with parachute synthetic material	42"x24"	1
Back side shade	Iron structure with parachute synthetic material	36"x24"	1
Speaker	As required	N/A	1
Liquid soap dispenser	Plastic material	500 ml	3
Hand sanitizer dispenser	Plastic material	500 ml	1
Plumbing fitting	1.5" flexible pipe, tee and fittings	1" uPVC pipe	1
Wastage bin	Plastic material	N/A	1
Solar light	Sensor light for night	N/A	2
Tab	10" tab	10"	2
Tab cover	Acrylic made tab cover	10"	2
Power bank	10000 mah power bank	10000 mah	1
Wooden three wheel van	MM-Iron and wooden structure with wheel, handle and rim, tire and tube	4'x6'	1

Development and combining process

- A 300L water tank to be placed on the van and secure it with an MS frame.
- The whole unit needs to be covered with PVC sheets.
- The sides of three-wheeler should be covered partly including the wheels.
- Shades made of synthetic sheets will be placed over each sink.
- Two basins to be fixed on the longer side at the height of 2.5 feet and one basin on the shorter side at 2 feet (Basins are detachable and to be placed when the device is in use).
- Water taps to be fixed at the selected points with necessary plumbing fittings and to be connected with the water tank.
- The magic pipes to be connected from each sink to a single pipe with a tee for wastewater collection at a central point with an extensive drainage pipe.
- A liquid soap dispenser to be placed beside each sink.
- Install detachable sound system in front of the unit in specified position, which also works as safe keeping place for supplies.
- Mount the Tabs (screen monitors) at two sides of the unit above the sinks.
Put in solar lights to lit during evenings



(a)



(b)



(c)

Figure 3: Different Components of 'Handwashing on Wheel' Device;

(a) handwashing sink side view,
 (b) opposite side view and
 (c) front side view If Illustration 2 specifies the components before,
 then maybe we can replace this figure with bona fide photos from
 different perspectives.



Handwashing on wheels in action:

Daily operation modalities mainly includes collection of water from a nearby DWASA pump or refill pump, house or other water supply sources, setting the unit at the strategic location which can be a market, bus terminal or any other crowded public place having drainage facilities. After serving people for handwashing, and promoting hand hygiene via AV system throughout the day (e.g. 8-10 hours operation), the unit returns to the garage for daily cleaning and overnight stay. Rented garage has been arranged for parking the 'Handwashing on Wheels' at night maintaining adequate safety against theft.

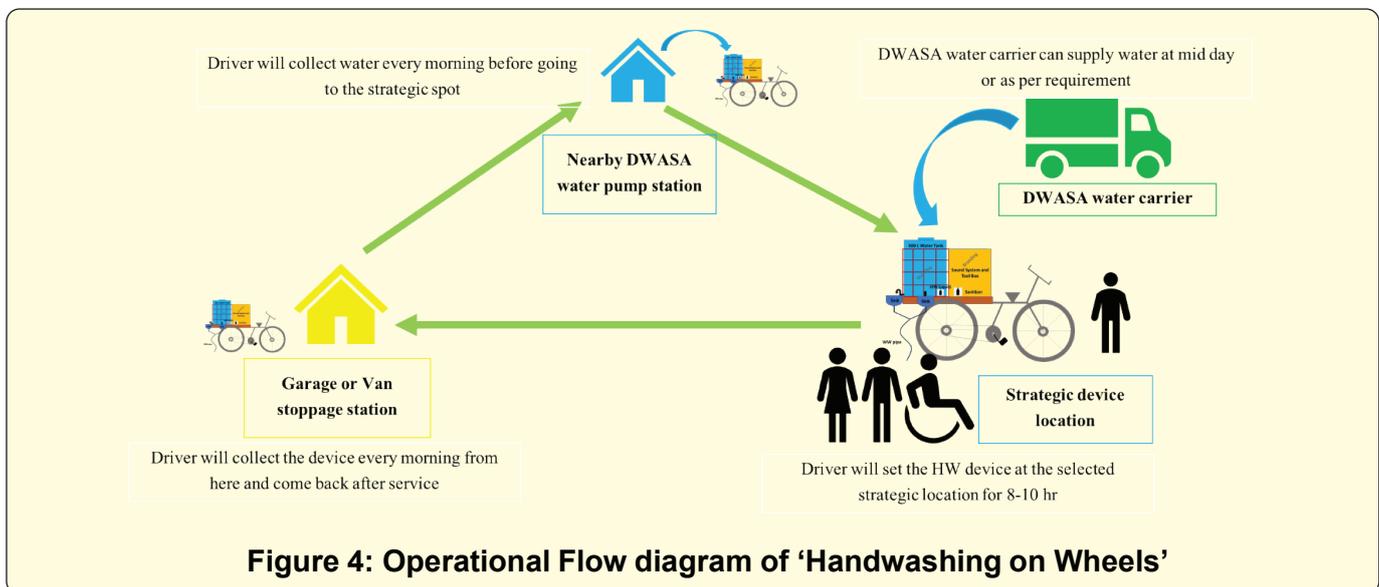


Figure 4: Operational Flow diagram of 'Handwashing on Wheels'

'Unit Operator and Hygiene Promoter' takes the responsibility of daily operation and maintenance of the amenity. S/he is also responsible for promoting handwashing among people through engaging in dialogue and facilitating the handwashing process by refilling water, and liquid soap as required and depositing wastewater to the appropriate drainage facilities etc. The Unit Operator and Hygiene Promoter is trained on preliminary WASH issues including daily reporting, system monitoring and tracking, water usages, refill, and counting of handwashing instances. Furthermore, supervisors from the organisation are assigned for periodic monitoring of the units to ensure its sustainability.

Cost breakdown

'Handwashing on Wheels' is a very simple yet unique design with a low installation cost. **The total unit cost is approximately 60,000 BDT (including VAT and TAX) excluding three-wheeler cost.** An approximate budget for a single unit is stated below

Particulars	MoU	Unit	Unit rate (BDT)	Amount (BDT)
300 L water tank	Pcs	1	3500	3500
SS steel basin	Pcs	3	1000	3000
Water tap	Pcs	3	500	1500
Wooden board structure with inkjet print and matt lamination	Sft	100	250	25000
Iron structure with parachute synthetic material	Sft	15	1000	3000
Speaker	Pcs	1	2500	2500
500 ml plastic handwash dispenser	Pcs	3	167	500
Hand sanitizer dispenser	Pcs	1	500	500
Plumbing accessories for wastewater	Ls	1	3000	3000
Plastic bin	Pcs	1	500	500
Sensor light for night	Pcs	2	1000	2000
10" tab	Pcs	2	10000	10000
Acrylic made tab cover	Ls	2		
10000 mah power bank	Pcs	1		
Construction cost	Ls	1	3000	3000
Total Price (Including VAT & Tax)				60000

Apart from construction, an approximate estimation for monthly operation of a single unit is stated below:

Description	MoU	Unit	Unit Rate [BDT.]	Total Amount [BDT.]
1. Three-wheeler and unit operator	Month	1	40000	40000
2. Garage Rent	Month	1	2000	2000
3. Handwashing agents	Month	1	3500	3500
4. Cleaning agents	Month	1	500	500
5. Other O&M cost	Month	1	4000	4000
Total Monthly O&M Cost (Without The Cost Of Water)				50000



Future scopes:

This model can be easily replicated by different organisations or individuals at crowded places like fair, football match, exam centres etc. Revenue models of operation can be thought of by introducing branding options on the unit or charging small fees for handwashing. This can be coupled with nearby street food options.

WaterAid team is currently working on enhancing the monitoring with sensor system count to record handwashing instances. Along with IP CC cameras to draw on self-regulated use diminishing more costs and its viability.

Introduction of 'Handwashing on Wheels' will be more beneficial at the beginning of the second wave of COVID-19 to reach to people with a handy option for washing hands at public places giving people to an opportunity to practice better hygiene to stay healthy.

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Patent:

'Handwashing on Wheels' is not patented or copyrighted, and WaterAid will not patent it. WaterAid believes the more opportunities to communities in need is provide with WASH access, the better it is. We expect to be cited by any entities using this model and are open to all possible partnership opportunities.

Partnerships

WaterAid is open to partnership on Handwashing on Wheels initiative. We believe in partnership and want this to be scaled up. Together we can support communities to tackle Covid-19 and sustain life-long good habits like handwashing with soap.

For more information on partnership contact:

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Appendices: Picture of components



Left Side Cover and Branding



Right Cover and Branding



Front Side Cover and Branding



Back Side Cover and Branding



Speaker Box



Shade

Appendices: Picture of components



Tab Cover



Tab



Solar Light



Basin



Water Tap



Wastage Bin



Liquid
Soap
Dispenser