

Improving Public Transportation in Rajkot (BRTS and Last Mile Connectivity)

CASE STUDY

Project Highlights

The project evaluated the options available for ensuring effective last-mile connectivity on the Rajkot Bus Rapid Transit (BRT) corridor, and explored the potential of electric mobility in the city to reduce its carbon footprint. ICLEI South Asia supported the Rajkot Municipal Corporation (RMC) in conducting a technical study of the existing BRTS, along with a study of the pre-feasibility potential for electrification of the BRTS. This study evaluated the effectiveness of short-term and/or long-term measures to improve ridership, further providing a broad implementation strategy to improve public transport and its usage. Four interventions, including BRTS electrification, last-mile connectivity by e-rickshaws / public bike sharing and BRT hybrid routes, were proposed as recommendations to improve the public transport system and promote low-carbon mobility. The RMC has initiated the process to procure 50 electric buses under the Faster Adoption and Manufacture of (Hybrid and) Electric Vehicles (FAME-II) scheme as a part of the BRTS electrification.

Background

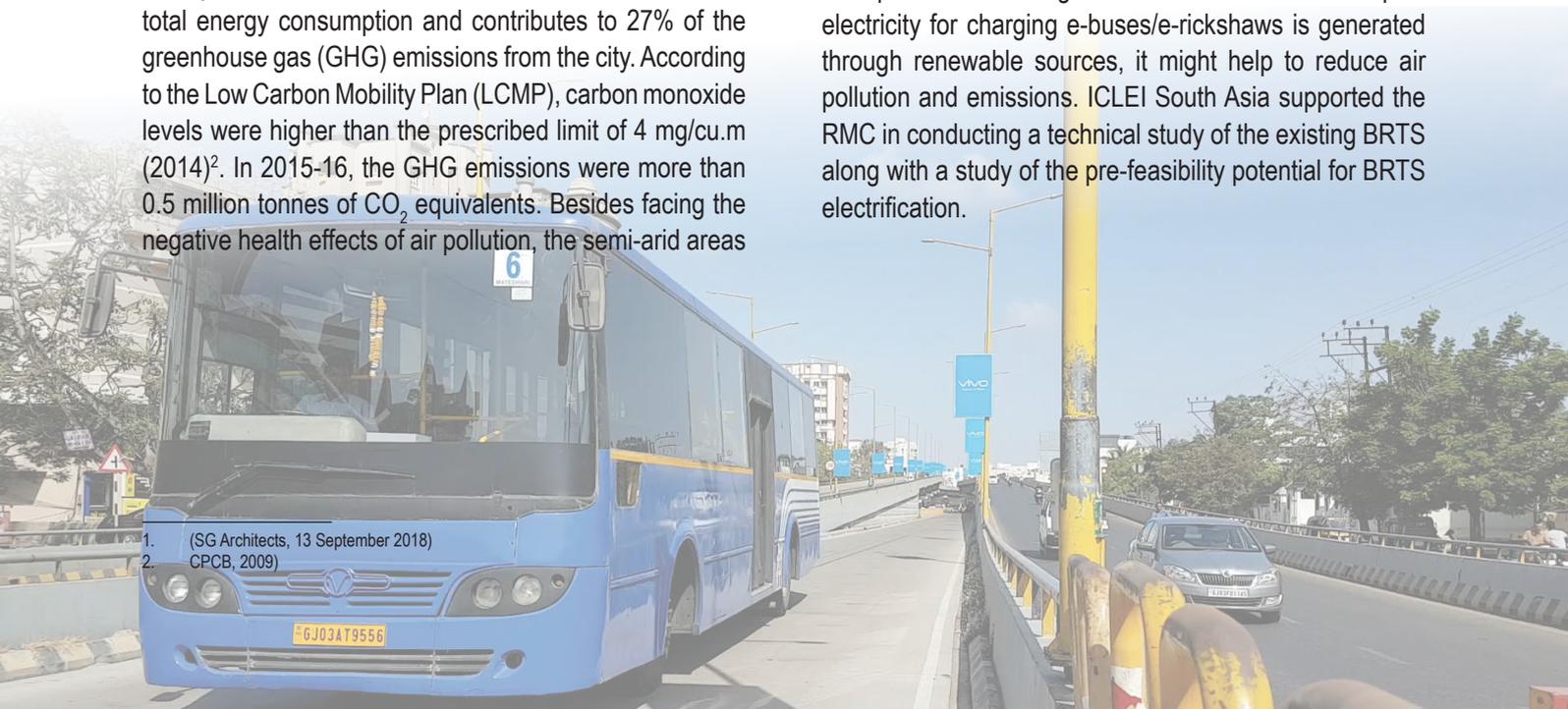
Rajkot is the fourth largest city in the state of Gujarat, covering 104.85 sq.km, and is managed by the RMC¹.

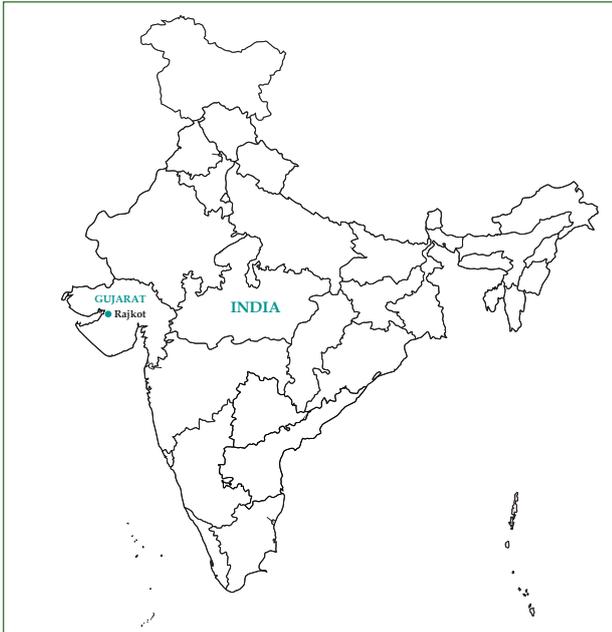
In Rajkot, the transport sector accounts for 49% of the total energy consumption and contributes to 27% of the greenhouse gas (GHG) emissions from the city. According to the Low Carbon Mobility Plan (LCMP), carbon monoxide levels were higher than the prescribed limit of 4 mg/cu.m (2014)². In 2015-16, the GHG emissions were more than 0.5 million tonnes of CO₂ equivalents. Besides facing the negative health effects of air pollution, the semi-arid areas

of Gujarat are also vulnerable to the effects of climate change. To combat these issues, there was a need to reduce emissions.

The electrification of the BRT corridor was expected to improve the existing BRTS and increase ridership. If electricity for charging e-buses/e-rickshaws is generated through renewable sources, it might help to reduce air pollution and emissions. ICLEI South Asia supported the RMC in conducting a technical study of the existing BRTS along with a study of the pre-feasibility potential for BRTS electrification.

1. (SG Architects, 13 September 2018)
2. CPCB, 2009





Case Study Location

Introduction

Indian cities require strengthening of capacities to identify, plan and implement measures for achieving lower GHG emissions and for enhancing resilience to climate change in an integrated manner. Swiss Agency for Development and Cooperation's project, Capacity Building for Low Carbon and Climate Resilient City Development project (CapaCITIES), was implemented from 2016-19 and provided support to Coimbatore, Rajkot, Siliguri and Udaipur.

Rajkot's initiatives in the mobility and air sectors may be categorised under indicator 1 and 2 of the Climate Smart City Evaluation Framework, i.e. 'low-carbon mobility' indicator with e-bus and e-rickshaws, hybrid routes and promotion of non-motorised transport (NMT). Another indicator is 'low-carbon buses' that would be deployed as feeder and fleet buses in the BRT corridor.

An LCMP was developed for the city in 2014 to encourage efforts to reduce GHG emissions. Public transport provision, pedestrianisation and development of cycling infrastructure were some of the initiatives taken up in stages towards achieving low-carbon mobility.

The initial BRTS stretch of 10.7km was a closed system, operating on one route from Gondal Road to Jamnagar Road. The RMC planned to increase the length of the BRTS to 63.5km later. The Urban Mass Transit

Corporation (UMTC) and SG Architects along with ICLEI South Asia provided technical assistance to the RMC for BRTS development.

A study was conducted to evaluate various short and/or long-term measures and to execute a broad implementation strategy to improve public transport. Last-mile connectivity, NMT integration and low-carbon mobility components were also part of this study.

Objectives

The objective of this study was to improve public transport and reduce private transport usage by:

- Improving the existing BRT system to serve the demands of the city's large population; and encouraging more ridership;
- Improving the last-mile connectivity and modal options for access to public transport;
- Reducing GHG emissions and air pollution in the city.

Project Targets

The overall improvement of public transport was targeted to reduce the use of private transport, which would lead to a reduction in GHG emissions.

The technical study aimed to improve ridership of the BRTS by integrating hybrid routes and by improving the last-mile connectivity to bus routes with PBS and e-rickshaws. The pre-feasibility study of electrification of the BRTS aimed to reduce the carbon footprint of the city.

Approach

The interventions planned to improve public transport and its connectivity included BRTS electrification, improvement of last-mile connectivity by using e-rickshaws and PBS and hybrid routes.

Proposed Interventions

Four interventions were proposed to the RMC for improving public transport through electric mobility integration and last-mile connectivity. These were as follows³:

- Electrification of BRTS - 11 buses were proposed to be replaced by e-buses that would be deployed on the BRT to promote low-carbon mobility.

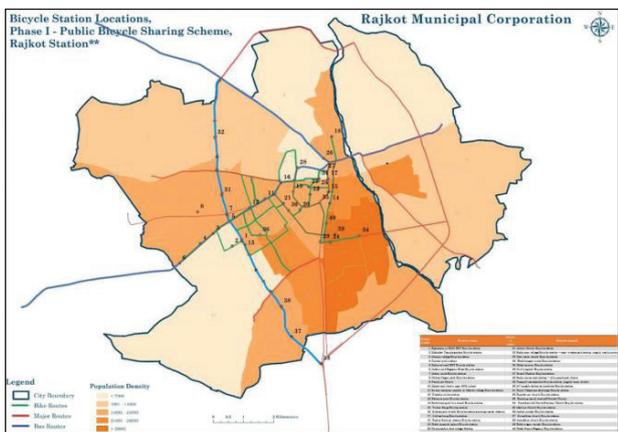
3. SG Architects, 13 September 2018

- Hybrid route - Two routes of hybrid BRTs were proposed to improve public transport connectivity. Distance, modal integration, network, increasing the average speed of active transportation users and decreasing the distance between crossing junctions were observed as important principles for BRTS improvement.



Proposed Hybrid BRT Route

- PBS as a last-mile connectivity option - 75 PBS stations were proposed to be developed in four phases.



Potential PBS Stations and Routes

- E-rickshaws as last-mile connectivity mode - potential e-rickshaw routes were proposed as per the demands of commuters.



Proposed E-rickshaw Route

Achievements

Rajkot is taking steps to implement the recommendations of the technical study and the pre-feasibility study conducted by ICLEI South Asia. The city has initiated steps to procure 50 electric buses for deployment in the city under the FAME scheme. These buses would operate on the BRTS and hybrid route/RMTS routes.

The PBS project is in the tendering stage. The RMC is also considering e-rickshaw deployment and hybrid bus route proposals for future integration.

Long Term Impacts

If electricity is generated through renewable sources, a reduction in CO₂ emissions might be observed. It is expected that emissions might reduce by 100kg CO₂ per annum per vehicle and by roughly 1 tonne CO₂ per annum for the entire fleet⁴.

The improvement of public transport connectivity and the BRTS might encourage commuters to shift from private transport to public transport.

4. RWTH Aachen University, 2018

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