

2019 Research Showcase

Footpaths and Electric Public Transportation: Keys for Smooth Transportation and Cleaner Air in Kathmandu

& STIC Annual Meeting

PROJECT TITLE

Footpaths and electric public transportation: Keys for smooth transportation and Cleaner Air in Kathmandu

STUDY TIMELINE

May 2019-Present

Researcher:

Nirmal Tamang, Norwich University

ADVISORS:

Tara Kulkarni, PhD, PE, Norwich University

Moses Tefe, PhD, Norwich University

This fact sheet was prepared for the 2019 VTrans Research Showcase & STIC Annual Meeting held at the Dill Building in Berlin, VT, on September 11, 2019 from 8:30 am– 1:00 pm.

Fact sheets can be found for additional projects featured at the 2019 Symposium at

<http://vtrans.vermont.gov/planning/research/2019showcase>

Additional information about the VTrans Research Program can be found at

<http://vtrans.vermont.gov/planning/research>

Additional information about the VTrans STIC Program can be found at

<http://vtrans.vermont.gov/boards-councils/stic>

Problem Statement

Kathmandu is the capital city of Nepal, among many threats to its development and civilization, air pollution and traffic congestion are affecting the residents primarily and directly. Replacement of current transportation mode by electric ones seems to be the obvious method but footpath's stealth role is imperial. With the average vehicle's speed under 8 miles/her and AQI of over 160, Kathmandu is moving nowhere but towards the city of Dustmandu.



Methodology

The research was conducted on Rind-Road in Kathmandu, and focused on air pollution data collection and traffic counts. Using air pollution sensors to track levels of carbon monoxide and particulate matter of 2.5 microns, as well as and a group of volunteers for a variety of traffic data collection, this research has, a) Estimated the total number of vehicles and wheels on Ring-Road, b) Calculated the number of Electric Buses required to replace all the fossil fuel vehicles, c) Calculated the wheel reduction relating to Particulate Matters, d) Recorded and explained the Air Quality level of Ring-Road over the five-week duration

Conclusions

Despite the conventional, particulate matters were impacting much more than the carbon-emissions. Exposed, unpaved and troubled footpaths release more than 80 % of the PMs. Replacing current ring-road traffic with Electric Bus will reduce the vehicle by 83% and number of wheels by 37%.

Potential Impacts and VTrans Benefits

This research can be helpful in estimating the Electric public Buses required in Kathmandu to satisfy the basic transportation need and stabilize the air pollution by re-establishing footpaths in most impactful sites. VTrans can possibly step up from this research and explore more on the research on smooth and inducing public transportation.