TECHNOLOGY FACTSHEET

IMPROVING THE TRAFFIC SIGNAL SYSTEM FOR SYNCHRONIZATION [1]

1. **Sector:** Transport

2. **Introduction:** Transport sector is a major GHG emitting sector in Sri Lanka. About 60% of the air pollution (especially in Colombo City) comes from this sector (AirMAC, 2009). The main way of transportation is through the road network, which is supplemented by rail, air, and water transport means. Out of passenger transport, buses carry about 50% and railways carry about 4% of the passengers, while the rest of the passengers are carried by the other modes (Jayaweera, 2011). Road transport accounts for about 96% of passenger transportation and 99% of freight transportation (Jayaweera, 2011). Currently, the transport sector in Sri Lanka utilizes petroleum-based fossil fuels, leading to significant amounts of CO_2 and other GHG emissions (e.g. N2O, CH4) considered under the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol. Technology transfer, defined as the flow of experience, know-how and equipment between and within countries, is one of the priorities under the United nations Framework Convention on Climate Change (UNFCCC). Technology needs assessment (TNA) is a key element of the technology transfer, and is carried out with the intention of moving towards cleaner, less GHG emitting technologies.

3. **Technology name:** Synchronization of traffic signals

4. **Technology characteristics:** In traffic signal synchronization, a series of traffic lights along the road turns green allowing smooth flow of vehicles, reducing the congestion and need to stop in the middle of traffic; this helps avoid travel delays, especially in heavy traffic, and causes lower emissions and air pollution The synchronization system is usually activated during morning and evening peak hours, and the signals are coordinated based on the congestion level. The existing traffic signals in these areas can be updated for having better synchronization. Updated traffic signal control equipment along with signal timing optimization can reduce congestion; in Texas, USA, synchronization of traffic signals reduced traffic delays by 23 percent (US Department of Transportation, 2011), while on average it can reduce the travel time by up to 15 percent (US Department of Energy, 2011).

5. **Country specific/ applicability:** This is an important technology, especially in avoiding the heavy traffic entering and moving out of city areas with heavy traffic during peak hours.

6. **Status of the technology in the country and its future market potential:** Currently there are ~120 traffic signals in the country and majority of those are in Colombo district. Currently majority of the traffic signals are controlled by the Roads Development Authority and Colombo Municipal Council. There is a need for establishment of more traffic signals at

[1] **This fact sheet has been extracted from TNA Report – Mitigation for Sri Lanka. You can access the complete report from the TNA project website** http://tech-action.org/

certain other intersections which are currently being controlled using traffic police officers. Traffic light synchronization will definitely help improve the efficiency of the existing traffic lights, while leading to a smoother flow of vehicles, high fuel use efficiency, and lower pollution.

7. **Barriers:** -

8. **Benefits**
    a. Socioeconomic:
        - Reduced congestion and enhanced time use efficiency
        - Better transportation system and improved quality of traffic light signaling
        - Avoidance of unnecessary traffic delays/stops
        - Improved safety, without having to make sudden stops
        - Higher fuel use efficiency.
    b. Environmental
        - Lowered air pollution and GHG emissions due to higher fuel use efficiency (But this is only a short term benefit, as smoother flow of vehicles with no congestion can draw more vehicles to the road over time).

9. **Operations:** -

10. **Costs:** US $ 2500-3100 per signal (US Department of Transportation, 2011)

11. **References**

- AirMAC 2009. Clean Air 2015. Air Resource Management Center. Ministry of Environment & Natural Resources, Sri Lanka
- Jayaweera, D.S. 2011. Analysis on effectiveness of fiscal strategies introduced on hybrid vehicles and market response- policy reforms on clean air. Presentation at the Center for Science and Environment Conference, India, held on September 28-29,2011
- U.S. Department of Transportation, 2011. Intelligent Transportation Systems for traffic signal control. Available at http://ntl.bts.gov/lib/jpodocs/brochure/14321_files/a1019-tsc_digital_n3.pdf
- U.S. Department of Energy (DOE). 2011. Traffic signal synchronization for energy savings. DOE Technical Assistance Program. DOE.