Use of Waste Plastic Bags in Road Construction through PPP

(Bangalore Municipal Corporation, Karnataka)

A) **Project objective:** To utilize the waste plastic bags in the bituminous mix of concrete for cost saving and improved performance of Roads through public-private-partnership.

Laying of road with bituminous mix blended with waste plastic

B) **Pre project situation:** Bangalore city generates nearly 15 tones of waste plastic bags every day. The mixing up of these waste plastic bags with other degradable organic waste Materials in the garbage of the urban areas have been the main cause of the problem in handling wastes that are collected in the city.

A portion of J P. Nagar Ring Road withstanding prolong pooling of water

C) **Project planning and implementation:** Focuses on various fronts are being done to improvise the Properties of mixes. It has been possible to improve the performance of bituminous mixes used in the surfacing of road pavements with the help of various types Of additives to bitumen such as polymers, rubber latex, crumb rubber treated with some chemicals. Hence, the Bangalore Municipal Corporation has experimented using a compound made of waste plastic bags in the construction of roads in 2002. So far, 35kms stretch of road has been laid using this compound. The cost difference for the roads lay with compound as against without is Rs500/CubicMeter. i.e., the capital cost Will increase by 7 % compared to the original cost of laying for every cubic meter of road length. For a stretch of 35 kms, nearly 3-4 tones of compound were used. After 2 years, the roads have not developed cracks, and provide smooth riding surface displaying much better durability (now extended to 800 Kms in Bangaluru city).

D) Post project impact

The same stretch of road unaffected by prolong pooling of water

i) The cost difference for the roads laid with compound as against without it is Rs. 500 / Cubic Meter.

ii) Saving of 8% by weight of bitumen

iii) Increase in compressive strength

iv) Indirect tensile strength values increased by 3 times

v) Provide smooth riding surface displaying much better durability

vi) This initiative demonstrates scalability of the project and a win - win situation for both constructions of roads and handling of waste plastic bags

E) Limitation: K.K Plastics has retained the patent of the product.

F) Lessons learned: The whole process of collection of plastic can be regularized by integrating it with solid waste management plan of BMP

G) Replication: Based on the success of the project at Bangalore, Calcutta and Delhi

government have entered into a dialogue with K. K. Plastics. BMP has also decided

to use the poly blend compound for all its future of road construction projects

H) Sustainability: About 40 tones of compound can be generated from 100-120 tones of

waste plastic bag. If the entire length of roads in Bangalore city is overlaid with the

poly-blend compound it will require about 9022 tones of compound. The maintenance

cost of the road will come down, as the road life is increased by 2 to 3 times