

Chapter 4

Environmental Management

Highways Department adopts an Environmental Management System accredited to ISO 14001 standard since 2003. The system supports our environmental management on different aspects such as highway project management, railway project management, and landscape management as well as office management.

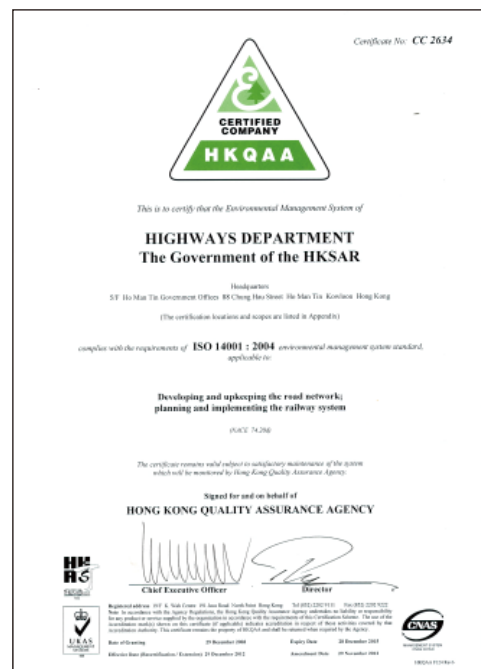
Environmental Management System

Highways Department implements the Environmental Management System (EMS) which is certified in full compliance with the requirements of ISO 14001:2004. Under the EMS, the environmental performance and the compliance with the environmental requirements including various legislations are regularly checked and monitored.



ISO 14001 : 2004
Certificate No. : CC2634

ISO 14001 EMS Accredited Logo



Certificate of ISO 14001:2004 EMS

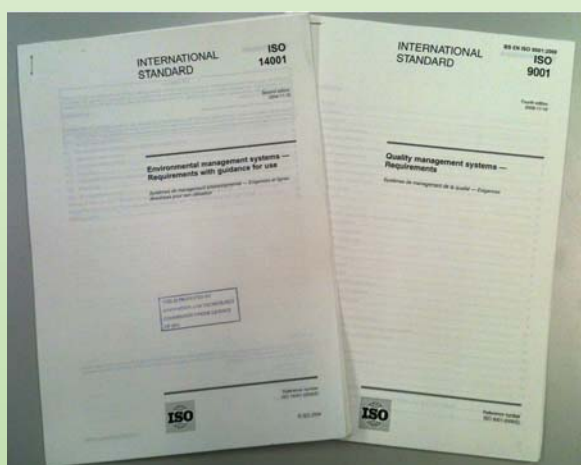
For the purposes of implementing and maintaining the EMS, the Department is divided into four Office Groups according to the main function of its offices. Each Office Group is led by a Management Representative (MR) with the assistance of Deputy Management Representatives (DMR) and Assistant Management Representatives (AMR) in the daily operation of EMS.



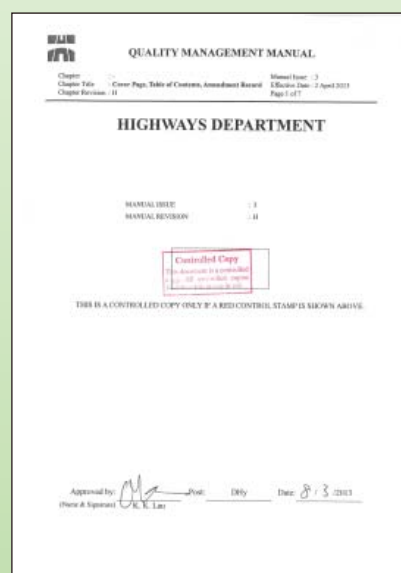
Four Office Groups

* Office Group 3 comprises Major Works Project Management Office and Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office

To suit the operations of Highways Department, the requirements in ISO standards have been transformed and specified in different internal management system documents such as the Quality Management Manual, Operation Procedures and Works Instructions. All staff members of Highways Department can make use of these documents to implement the EMS accordingly. These documents are reviewed and revised regularly to cope with the changes in the work requirements.



ISO Standards

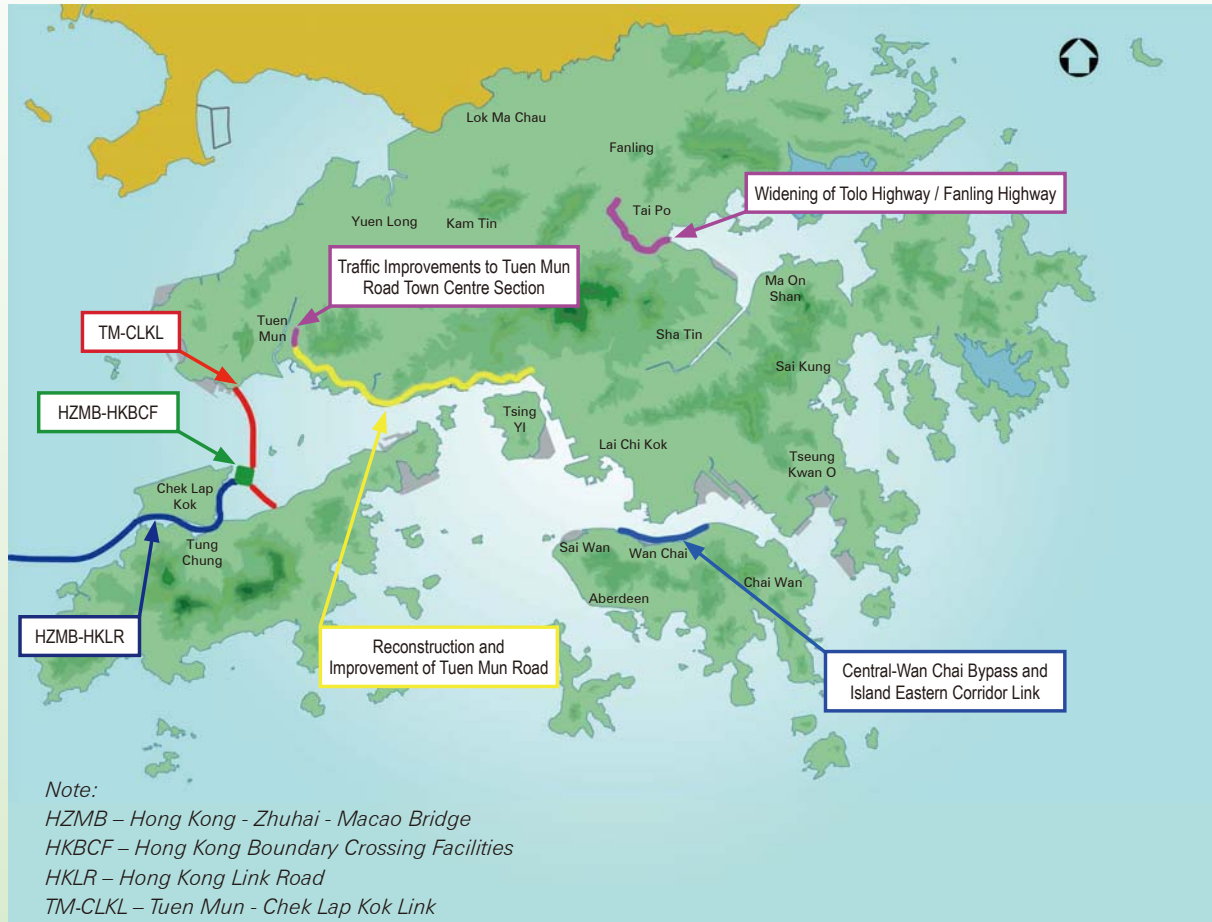


Quality Management Manual

In addition, both External and Internal Management System Audit to the EMS are organized annually to monitor the overall performance of different offices/regions/divisions/units in the department with respect to the compliance of relevant environmental standards and procedures. The audit results are presented in the Departmental Quality Management Committee and Office Quality Management Committee meetings for review by the senior management.

Environmental Management in Highway Project

Highways projects are implemented by the Works Division, the Major Works Project Management Office (MWPMO) and the Hong Kong – Zhuhai – Macao Bridge Hong Kong Project Management Office (HZMB-HKPMO) of Highways Department. Some of the major highway projects under construction are shown in the diagram below.



Alignments/locations of major highway projects


In order to prevent or mitigate potential environmental impact arising from the construction, we monitor the environmental performance of our contractor through the following measures under the respective contract:

- ◆ Regular environmental walks jointly conducted by the contractor and the Engineer's Representative
- ◆ Regular inspection and monitoring by the Environmental Team and the Independent Environmental Checker required for designated projects under the Environmental Impact Assessment Ordinance
- ◆ Monthly Site Safety and Environmental Management Committee Meeting chaired by the Engineer's Representative
- ◆ Regular Environmental Inspection by our project officers

In addition to typical environmental measures, special measures have also been adopted to cater for challenges faced by different projects.

Typical Environmental Measures taken in Construction Site

Dust Control



Automated water sprinkler at haul road

This image shows a dirt haul road at a construction site. A yellow vehicle is driving on the road, and a line of green tarps is visible on the right side. The road is bordered by orange safety fencing.

Noise Mitigation



Drilling rigs covered by tarpaulin sheets

This image shows two large drilling rigs at a construction site. The rigs are completely covered with green tarpaulin sheets. In the foreground, there are red and white safety barriers.


Wastewater Management



On-site wastewater treatment facility

This image shows a large, blue, industrial-looking structure, which is an on-site wastewater treatment facility. It has a complex metal frame and various pipes and valves.

Sustainable Energy



Solar Panel

Wind Turbine

This block contains two images. The first image shows a solar panel mounted on a metal frame, tilted towards the sun. The second image shows a small wind turbine mounted on a pole in an open area with buildings in the background.

Waste Management



Recycle Bins

This image shows a row of four recycling bins in different colors (yellow, blue, brown, and green) placed outside a building. There are also some other items like a small tree and a metal cage nearby.

Tree Preservation and Greening



Fenced off retained tree before transplant

Slope greening

This block contains two images. The first image shows a large tree that has been fenced off with yellow and black tape, indicating it is being preserved before being transplanted. The second image shows a steep slope being greened with green mesh and plants, with workers visible on the slope.

Special Environmental Measures for Tuen Mun Road Town Centre Section Project

The Project “Traffic Improvements to Tuen Mun Road Town Centre Section (TMRTCS)” is to meet the anticipated traffic growth in the Northwest New Territories and from the cross-border activities.

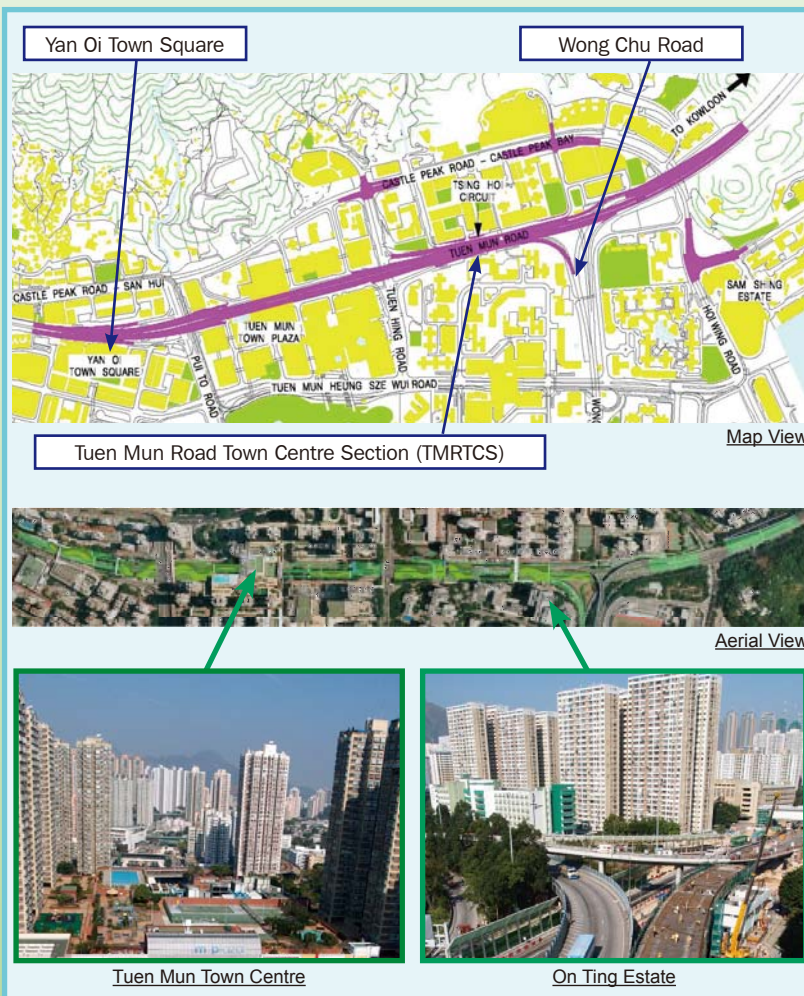
The project comprises:

- widening of approximately 1.5km long Tuen Mun Road (TMR) between Yan Oi Town Square and Wong Chu Road from a dual 2-lane carriageway to a dual 3-lane carriageway,
- resurfacing of existing section of TMRTCS,
- construction of a 450m long single-lane flyover,
- reconstruction of four existing footbridges, and
- construction of noise barriers/enclosures together with installation of vertical greening and roof greening on these noise barriers/enclosures, etc.

The construction work commenced in February 2010 and is anticipated to be completed by the early 2014.



Heavily populated residences, shops and schools adjacent to the project area



The project is a designated project under Scheme 2 of the Environmental Impact Assessment Ordinance, in which an Environmental Impact Assessment (EIA) study was required to be conducted on the project. The EIA study completed in 2008 revealed that the construction site was subject to severe site constraints, i.e. being adjacent to heavily populated residences, shops and schools as well as the requirement to maintain existing traffic lanes during daytime on TMR, etc. Noise nuisance generated from the construction activities is one of the paramount environmental issues to be addressed. As such, good site practice and management to address the noise impact of construction site activities on nearby Noise Sensitive Receivers (NSR) are significant aspects of the project.

Noise Sensitive Receivers (NSR) along the site

Site Practice

The good site practice includes the following:

- ◆ Only well-maintained construction plant should be operated on-site and all construction plant should be serviced regularly during the construction period;
- ◆ Machines and plant that may be in intermittent use should be shut down between work periods or throttled down to a minimum as necessary;
- ◆ Plant known to emit noise strongly in one direction should be orientated to direct noise away from the NSR;
- ◆ Mobile plant should be sited as far away from NSR as possible; and
- ◆ Material stockpiles and other temporary structures should be effectively utilized to screen noise from on-site construction activities.

Construction Management

From the construction management perspective, noise mitigation measures have been implemented to reduce noise to the acceptable construction noise limit to avoid causing noise nuisance to nearby NSR during construction stage.

The following are some examples of these noise mitigation measures:



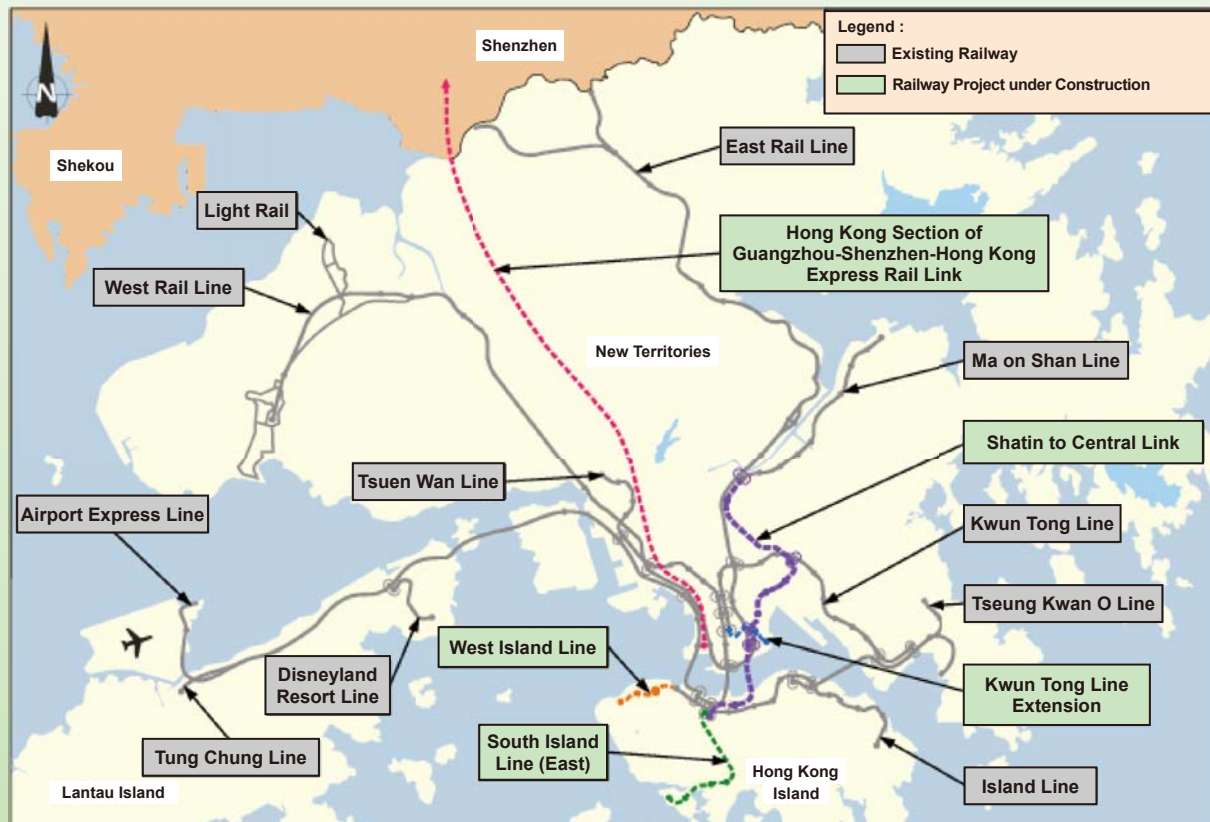
Development of Environmentally-friendly Railway System

Railway is a safe, efficient and environmentally-friendly mass transportation carrier. The Government policy places emphasis on railway development as the backbone of public transport. Highways Department adheres to this policy and aims at planning and implementing the railway system to world-class standard.

Overview of Railway Development

The "Railway Development Strategy 2000" published in 2000 provided a blueprint for the next phase of railway development which included a number of new railway schemes to meet Hong Kong's increasing transport needs in a sustainable manner. Less reliance on road-based transport will alleviate the pressure on transport systems, reduce overall tailpipe emission from vehicles and, in turn, lessen the impact on the environment.

Eight new railway lines, or extensions of existing lines, were commissioned between 2002 and 2009. The West Island Line, the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link, the Kwun Tong Line Extension and the South Island Line (East) were in full swing under construction in 2012. The Shatin to Central Link also commenced construction in mid-2012.



Alignment of railway lines

The Railway Development Office of Highways Department commissioned a consultancy study in March 2011 to review and update the "Railway Development Strategy 2000". This study would review and update the railway development plan taking account of the latest development of the community and changes in planning factors to meet the transport demands for railways up to 2031. The stage 1 public engagement of the study was completed in July 2012. It is anticipated to complete the study in 2013.

Environmentally-friendly Measures for Construction of South Island Line (East)

The South Island Line (East) is a medium-capacity railway connecting the Southern District of Hong Kong to the existing network at Admiralty with a distance of approximately 7 km. A train stabling and maintenance depot will be located in Wong Chuk Hang. Construction of the South Island Line (East) commenced in 2011 for completion expected in 2015.

The construction of the Wong Chuk Hang Depot and South Horizon End Plant Building requires the removal of over 50,000 cubic metres of rock. An enhanced construction method using open blast has been adopted instead of the traditional mechanical breaking method. As a result, the construction noise impacts have been reduced in both noise levels and duration.



Alignment of South Island Line (East)



Open blasting for construction of Wong Chuk Hang Depot and South Horizon End Plant Building

Apart from the construction method, environmentally-friendly measures have also been implemented in works area along the railway route. Water recycling system has been installed at the Nam Fung Tunnel Portal construction site to conserve and reuse the wastewater generated from the works. Green roof made of natural grass has been installed at the site office adjacent to the Ocean Park Station. This provided a green rest area and has reduced the solar load on the building which reduced the air conditioning need in the hot season.



Construction run-offs treatment and reuse at Nam Fung Tunnel Portal



Green roof provided for Ocean Park Station site office

Colourful Highways Experience

Ever since Highways Department started to maintain vegetation on SIMAR* slopes along all public roads under our management in 2004, it has been our mission to provide a safe, pleasant and green road network to the general public of Hong Kong. Apart from upkeeping our slope and highway vegetation in a safe and tidy condition, Highways Department also aims to enhance the visual and environmental quality of our slope and vegetation. Mostly native species have been selected for planting for their visual interest, attractiveness to wildlife and the creation of a visually pleasing highway landscape with seasonal effect. The following photographs highlight our highway landscape in different seasons with an array of floral and foliage colours.

* Slopes identified in Systematic Identification of Maintenance Responsibility of Slopes in the Territory (SIMAR) project.

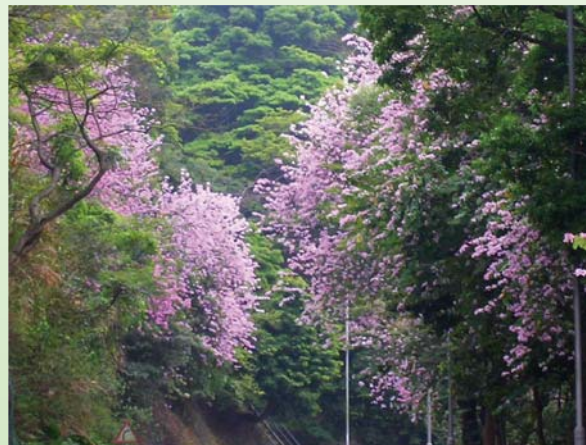
Pink in Early Spring



Location: Lai King Hill Road



Bauhinia variegata (Camel's Foot Tree)



Location: Route Twisk



Flowering Period: January – March
Location: Route Twisk, Tsuen Wan

Orange in Summer



Species name: *Delonix Regia* (Flame of the Forest)
Flowering Period: June - July
Location: Ping Ha Road, Yuen Long

Red in Autumn



Species name: *Sapium sebiferum*
(Chinese Tallow Tree)
Location: Tam Kon Shan Rd, Kwai Tsing



Species name: *Liquidambar formosana*
(Chinese Sweet Gum)
Location: Hilltop Road, Tsuen Wan



Species name: *Rhus succedanea*
(Wax Tree)
Location: Route Twisk, Tsuen Wan

Yellow/Golden in Winter



Species name: *Celtis sinensis* (Chinese Hackberry)
Golden Colour Period: December - February
Location: Route Twisk, Yuen Long section



Species name: *Litsea cubeba* (Fragrant Litsea)
Flowering Period: December - February
Location: Route Twisk, Tsuen Wan section

Green Office Management

In support of the Government's drive to save natural resources, we are committed to making every endeavor to make our green office management a greater success. In addition to energy saving as mentioned in Chapter 3, we have been making our best effort to save other resources.

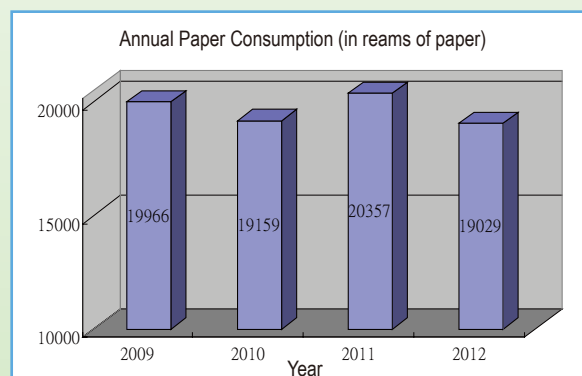
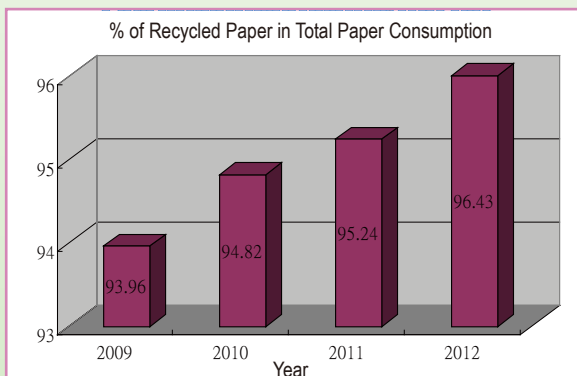
Resources Saving

Paper Saving

To align with the green office initiative, we have promulgated and would continue with the following measures to minimise paper consumption:

- ◆ Use both sides of paper for printing and photocopying.
- ◆ Use the blank side of used paper for drafting/photocopying for internal document/correspondence/fax document.
- ◆ Use electronic means extensively for communication (for instance, use electronic files and keep the use of hard copies to the minimum).
- ◆ Reuse envelopes and file covers.
- ◆ Encourage the use of recycled paper.

In 2012, we consumed 19,029 reams of paper (representing a saving of 6.52% of that of 2011) of which 96.43% were recycled paper.



Waste Recycling

We encourage collection of waste with recycle value by taking the following measures over the years:

- ◆ Put up green boxes to collect reusable envelopes and papers.
- ◆ Collect computer printer toners and ink cartridges for refilling and recycling.
- ◆ Put up recycling boxes to collect used paper, CDs, plastic bottles, aluminum cans and rechargeable batteries for recycling.



3-colour recycle box



Battery recycle box

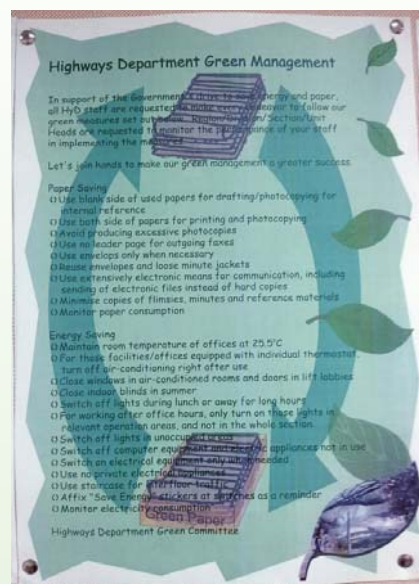
Promotion of Staff Awareness

We have adopted various measures to arouse environmental awareness of staff and to engage them in maintaining a green office:

- ◆ Re-circulate environmentally related departmental guidelines regularly through e-mail and the intranet.
- ◆ Display posters to promote economical use of resources and green housekeeping measures.
- ◆ Invite staff to put forward suggestions on green management such as through the Staff Suggestions Scheme.
- ◆ Extend the green office concepts to daily life through activities such as donation of scarves organised by the Highways Department Recreation and Sports Committee.



Donation of scarves



Display poster of green housekeeping measures

Auditing

Annual Environmental Audit

We conduct annual environmental audits in all 15 offices located in different premises with a view to maintaining the impetus of green measures in housekeeping. The objectives of conducting annual environmental audits are:

- (i) to assess compliance with the green housekeeping guidelines;
- (ii) to identify non-compliance and recommend remedial actions;
- (iii) to promote good environmental management; and
- (iv) to increase staff awareness of green management and occupational safety and health initiatives.

Our offices have been making continuous efforts to comply with the green housekeeping guidelines. We have also taken the opportunity to share among the offices the green management best practices.

Energy Audit

To upkeep our effort in energy saving, an Energy Audit for HMTGO had been conducted by the Government Property Agency (GPA) which identified three energy management opportunities. In 2012, we completed the replacement of the T8 fluorescent lighting fittings with T5 ones in areas which had not been covered yet. In addition, we worked together with GPA and the Architectural Services Department to take forward the other two identified energy management opportunities, being:

- (i) the installation of motion sensors in carparking areas so that lighting would be switched off when no motion is detected; and
- (ii) the replacement of the existing fluorescent lighting fixtures by dual lights fixtures completed with motion sensors in staircases.