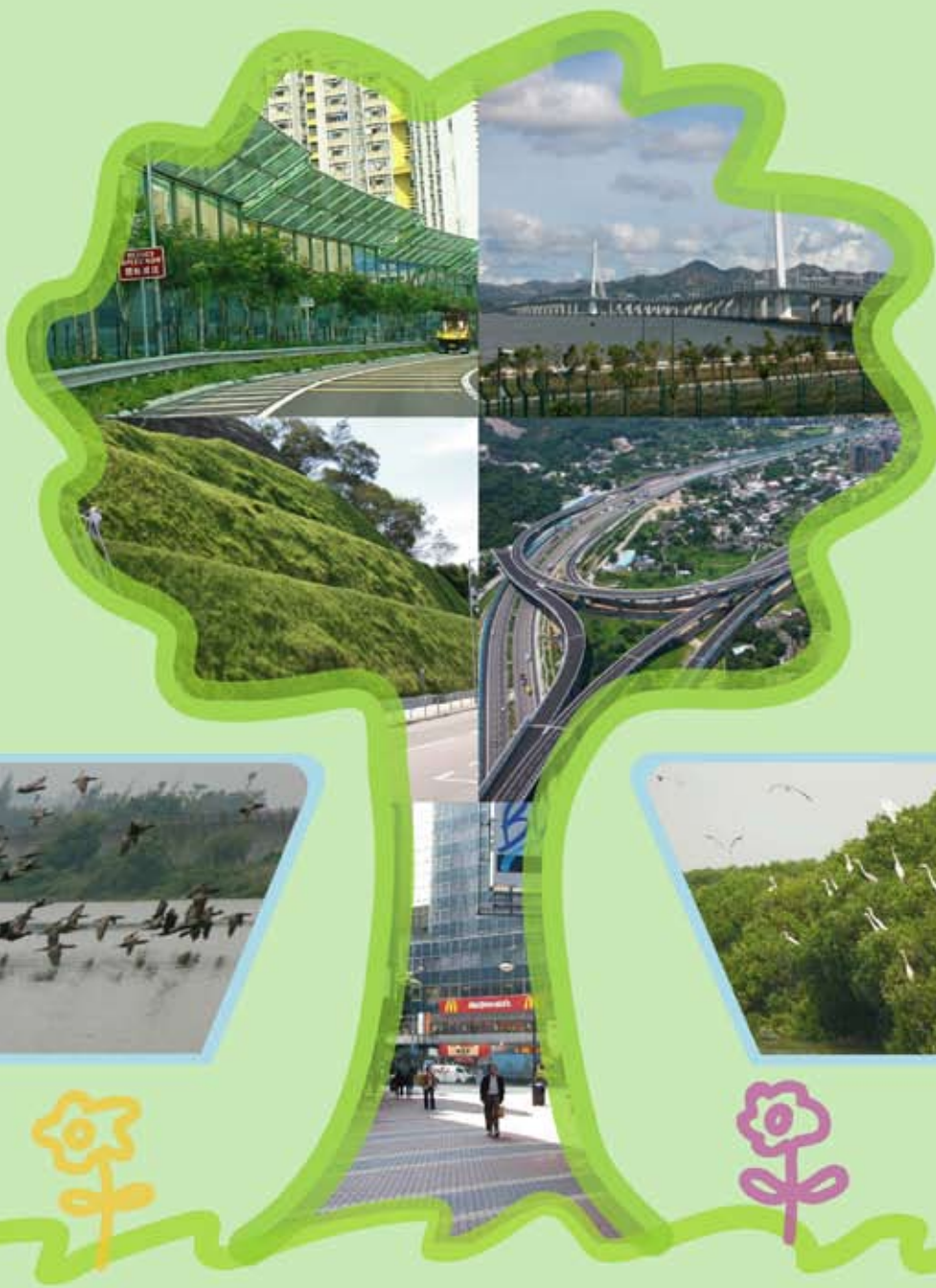


ENVIRONMENTAL REPORT 2007



Highways Department

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Director's Message



It is my pleasure to present to you our fifth Environmental Report which summarized the efforts we have taken to achieve our environmental goal in the year of 2007.

In this report, we share with you our experience on environmental management in capital works projects. This covers heritage conservation in the vicinity of the Central Kowloon Route, which is a commitment of the Government. Green procurement approach in works tenders, implementation of environmental nuisance abatement measures on sites, as well as monitoring of contractors' performance will be demonstrated with details.

Our greening efforts on asset management are displayed in our investigation study for greening of highways structures. You may also be interested in our research on greening and aesthetics design of the noise barriers.

To pave the way forward, special attention has been given to research and technology on low noise road surfacing, recycled pavement materials and common utility enclosure.

Under the Clean Air Charter on air pollutions in Hong Kong, an Energy and Emission Management Team has been set up in the department to formulate various initiatives. One of the initiatives is to reduce the use of Volatile Organic Compounds at source. We will continue the installation of electronic ballasts with a view to saving energy for public lighting. On the other hand, an energy audit to identify opportunities on energy saving in our offices at Ho Man Tin Government Offices Building has also been arranged.

Notwithstanding our efforts made in the year of 2007, we shall continue maintaining our contributions in protecting our environment and searching for every opportunity for a blue sky and better environment.

I hope you will find this report interesting.

A handwritten signature in blue ink, appearing to read 'Wai Chi-sing'.

WAI Chi-sing
Director of Highways
June 2008



About this Report

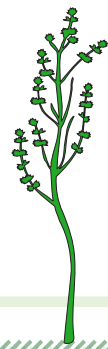
This report covers the period from 1 January 2007 to 31 December 2007. It shows the environmental awareness of our work and our efforts in environmental management, asset management, research and technology, Clean Air Charter, and green office management. Environmental awards, achievement of environmental objectives for 2007 and the new targets for 2008 will also be covered in this report.

This report is published in CD-Rom format and uploaded to our web site to reduce paper consumption.

About Highways Department

The Highways Department is responsible for:

- implementation of highway projects in the Public Works Programme;
- maintenance of public roads, including road furniture, road drainage and roadside slopes, and co-ordination and control of utility openings on public roads;
- planning, monitoring and coordinating the various activities associated with the implementation of new railway projects;
- providing design input for road lighting, highways structures, roadside slope upgrading and landscape features associated with capital works projects and maintenance works;
- inspecting the safety provision on highway construction sites;
- researching into new materials, techniques and standards; and
- providing engineering, quantity surveying and landscaping technical services.





The Department's Headquarters are located in Ho Man Tin Government Offices, with sub-offices in North Point Government Offices, Cheung Sha Wan Government Offices, Cheung Sha Wan Plaza, and Skyline Tower and Nan Fung Commercial Centre in Kowloon Bay. We have an establishment of some 400 professionals and 1,570 technical and general grades staff. We maintain about 2,009 km of roads and 12,564 roadside slopes in the territory. The total operating expenditure for the financial year 2007/08 is \$1,998 million.

Environmental Goal

Our environmental goal is to accomplish public works efficiently and with due regard to the environment.

Environmental Policy

Our policy on protection of the environment has been integrated into our Department's Management Policy with its latest version promulgated in August 2007. To achieve the goal of protecting the environment, we place emphasis on the environmental considerations of our work under the Environmental Management System. We act on the policy by:

- **identifying environmental aspects in all stages of our work, controlling their impacts and preventing pollution as far as practicable;**
- **monitoring the performance of our contractors to ensure good quality of works and prevention or mitigation of potential environmental impacts arising from our projects;**
- **complying with relevant legal and other requirements;**
- **using resources efficiently and minimizing waste arising from our projects; and**
- **identifying opportunities for continual improvement.**



Environmental Management of Works Projects

Protecting the environment as far as practicable in our work remains one of our top commitments. We systematically manage impacts that our work may have on the environment and ensure that all our activities are carried out in an environmentally responsible manner.



Environmental Impact Assessment for Works Projects

In delivering a new works project, we identify at the planning stage the environmentally sensitive areas and try to avoid its impacts on the environment. During the design stage, we set up operational control requirements on the significant aspects and identify mitigation measures for inclusion into the project documents. With a view to protecting residents and other sensitive receivers from adverse environmental impacts of the proposed works, we go through the Environmental Impact Assessment (EIA) process as required under the Environmental Impact Assessment Ordinance (EIAO). The process usually covers an assessment on noise, air and water pollution; landscape and visual aspects; and impact on ecology, cultural heritage and archaeological sites during both the construction and operation stages of the project. It identifies the sectors of the community and aspects of the environment likely to be affected, quantifies impact sources, and evaluates the severity of impacts on potential affected uses. If any adverse impact is identified, we provide measures to avoid such impact or to mitigate it to an acceptable level.



EIA for Central-Wan Chai Bypass and Island Eastern Corridor Link

An Environmental Impact Assessment (EIA) Report was prepared under the EIAO. The proposed environmental mitigation measures recommended in the EIA Report are highlighted below:

- use of quiet powered mechanical equipment;
- use of temporary movable noise barrier;
- provide silencers for ventilation fans in ventilation buildings;
- use of silt curtain;
- translocation of potentially affected coral colonies;
- reduction of dredging rate;
- use of floating booms to confine floating refuse from working barges;
- use of geosynthetic containers for disposal of highly contaminated dredged mud; and
- air quality monitoring for operational performance of the East Ventilation Building and associated East Vent Shaft.

We shall apply for Environmental Permits (EPs) from Environmental Protection Department and incorporate the conditions in the EPs together with the mitigation measures into relevant contracts for implementation.

Preservation of Heritage for Central Kowloon Route

The proposed Central Kowloon Route (CKR), a dual 3-lane trunk road across central Kowloon linking West Kowloon in the west and the proposed Kai Tai Development in the east, will mainly comprise tunnel sections.

The proposed alignment of CKR may affect the existing Yau Ma Tei Police Station which is a Grade III historic building. In the investigation study which commenced in August 2007,

various alignment options and impacts to the police station are being studied as a measure for heritage preservation. Consultation activities are held to keep concerned parties informed about the progress of the study and to collect their views on the approach to be adopted for the preservation of the building.

A built heritage impact assessment will also be carried out in the investigation study to identify known and unknown heritage items related to the CKR alignment (including the Yau Ma Tei Police Station) and to assess the direct

or indirect impacts with recommendation for mitigation as appropriate.



Yau Ma Tei Police Station – a Grade III historic building



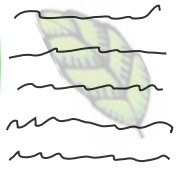
Green Procurement in Works Tenders

Incorporation of environmental clauses into the tender documents

In addition to incorporation of all relevant standard environment-related clauses promulgated by the Development Bureau into the tender documents, further measures to be carried out by the contractors are also included in the tender documents to further protect the environment. These measures include the following: -

- Vehicles for the Engineer shall be equipped with engines propelled by petrol, liquefied petroleum gas (LPG), electricity, hybrid of petrol-electricity, or any other non-fossil fuels;
- where appropriate, metallic materials shall be used for temporary works;
- site depots shall be surfaced with reclaimed asphalt pavement;
- all electrical appliances and equipment used in the site shall bear Energy Efficiency Labels where practicable; and
- for contracts involving considerable earthworks, wheel washing facilities shall be provided.

TENDER



In the tender documents, tenderers' attention is particularly drawn to the contract requirements in respect of the use of environmentally friendly plant/materials. For projects requiring environmental permits under the Environmental Impact Assessment Ordinance, the Environmental Permits issued to the Department are included in the contracts requiring the contractors to observe and abide by the conditions set out in the Permits.

Tender submission and tender evaluation

As a general policy, tenderers' past convictions records on environment-related offences will be checked and considered prior to recommendation of the tenderers for award of contracts. Where a marking scheme is adopted for assessment of the tenders, extra credits will be given to the tenderers who propose better environmental protection measures in their technical proposals.

Both hard and soft copies of tender documents for works contracts are issued to the tenderers. Tenderers are allowed to submit tenders in the traditional hard copy format or partly in electronic format.

Environmental Management in Construction Sites

In general, our contractors in capital works contracts are required to prepare and implement Environmental Management Plans (EMP) comprising abatement of environmental nuisances on construction sites and reduction of construction and demolition (C&D) materials. Typical EMP contains mainly the organizational structure of project team in respect of environmental management, summary of environmental impacts identified and the associated mitigation measures, waste management plan as well as the procedures for handling environmental emergencies.

General environmental nuisance abatement measures in works projects

The photographs below show some of the environmental nuisance abatement measures carried out on site by our contractors:

Water Pollution



Silt curtain as water pollution nuisance abatement



Toilet facilities were provided in works area



Sedimentation tank with flocculant dosing



Air Pollution



Plastic and tarpaulin sheets as dust pollution nuisance abatement



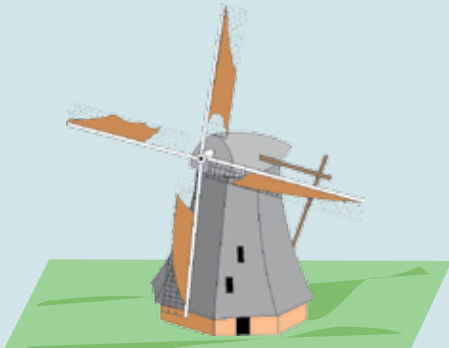
Dusty material covered up



Dump truck fitted with automatic covers



Fugitive dust control



Waste Pollution



Waste collection bins for different categories of wastes



Storage of chemical waste to avoid work site contamination

Noise Pollution



Silent piler was used for driving sheetpiles in front of Kwai Tsing Theatre



Waste Management

The strategy for management and disposal of all construction and demolition (C&D) materials is based on the principle of sorting and re-use as far as practicable.



Recovery of steel reinforcement bars from broken concrete



Sorting out of good quality granite from cut-slope work for reuse



Using of recycled grade 200 rock fill from Public Filling Area as temporary road sub-base



Monitoring of Contractors' Performance on Environmental Protection

In general, a contractor's overall performance including the individual aspect of performance on "environmental pollution control" is subject to quarterly review after the contract commences. In the event of unsatisfactory environmental performance, it will be reflected in the Contractor's Performance Report, which may lead to possible suspension of tendering.

Environmental Management System

Our Department implements the Environmental Management System (EMS) certified to ISO 14001:2004. Under the EMS, the contractors' environmental performance and their compliance with the environmental requirements including various legislations are regularly checked and monitored.

We monitor the environmental performance of our contractors through:

- Regular environmental walks jointly conducted by the contractor and the Engineer's Representative
- Regular inspections and monitoring by Environmental Team and 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 inspections by our project officers
- Site checks by the Engineer's



Representative or his site supervisory staff in monitoring the trip ticket system implemented by the contractor

- Spot checks by site supervisory staff to ensure that vehicles carrying dusty material are properly and securely covered before leaving construction sites
- Task-oriented audits to assess effectiveness of the contractors' performance in controlling mosquito breeding on construction sites and compliance with legislative and other requirements

In the event that a contractor is found to be non-compliant, corrective action will be identified and implemented. With an aim of monitoring closely the contractor's follow-up actions, any non-compliance with legal requirements (i.e. potential offence / offence) once identified will also be brought to the attention of the senior management in the Department. Project staff regularly review the progress of the follow-up actions taken and report them to the senior management until completion of the actions.

For those contracts under "Pay for Safety and Environment Scheme", the performance of the contractors in implementing the Environmental Management Plan is monitored under the framework described in ETWB TCW No. 19/2005 "Environmental Management on Construction Sites" and its interim guidance note issued on 19 June 2006. The contractors will receive monthly payment only if they have satisfactorily performed the items as specified in the contracts.



Environmental Training

The Department is committed to providing environmental training for all levels of staff. To promote understanding of the principles and operation of the Environmental Management System (EMS) complying with ISO 14001, all staff newly posted to the department would attend a relevant awareness course. Moreover the Training Services Unit arranged training on 2-day EMS Internal Auditor courses for staff who are required to serve as internal auditors.

Adequate training opportunities were provided to frontline staff to brief them on environmental monitoring procedures and checking requirements under the department's EMS. Latest changes in handling and reporting of identified non-compliance with legal requirements were also included in the training. Moreover our professional and technical staff also attended training courses on environmental legislation conducted by EPD.

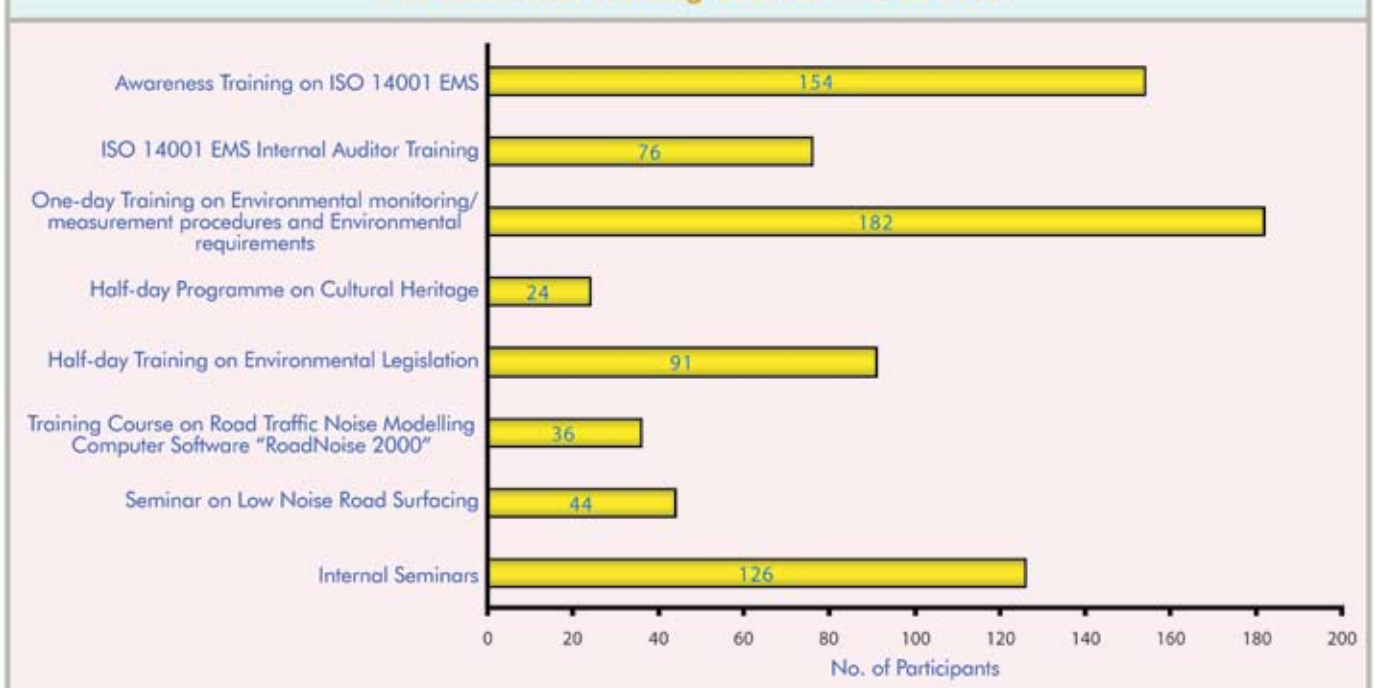
The department had procured the computer software "RoadNoise 2000" which was used for the assessment of road traffic noise and design of noise barrier. Relevant training including EPD's requirement on

noise assessment method for our staff was conducted so that they could get hands-on experience of using the software.

To enhance knowledge and awareness about heritage and conservation, we have arranged with the Department of Architecture at The University of Hong Kong to organise a half-day programme for our professional staff. The programme, comprising two interactive lectures and a mini-workshop, introduced the subject on cultural heritage and also looked at the multiple values carried by cultural heritage assets with emphasis placed on buildings and public spaces. The mini-workshop gave participants the opportunity to apply their understanding on cultural heritage and associated values to a specific area in Hong Kong.

Besides, the department organized regular internal seminars to promote experience sharing among the professional staff. Topics related to environmental issues included the latest developments in technology of low noise road surfacing in Europe and application of solar power in public lighting.

Environmental Training Courses held in 2007



Sustainable Asset Management

Take every opportunity to introduce green,
And maintain road like a well-oiled machine,
A streetscape that's safe and a 'sight for sore eyes',
To reduce and recycle – the sustainable prize



Investigation Study for Greening of Highway Structures

Highways Department has been actively participating in enhancing the urban environment by incorporating more greenery whenever new roads are planned. Planting at grade along footbridges; parapets, and around structure columns have been implemented in some areas. To further enhance the environment with more greenery and to soften the appearance of road structures, HyD has been carrying out an investigation study into the feasibility of providing greenery on road structures, such as, decks, structure roofs, columns and piers etc. in a safe, user and maintenance friendly, cost effective, sustainable as well as aesthetically pleasing manner. The study is anticipated to complete in 2008.

Also, there are various proprietary greening treatments available in the market, their application to both existing and new highway structures may not be always appropriate in terms of safety, sustainability, cost effectiveness and attractiveness. Different current greening treatments in Hong Kong and 4 other oversea countries are being studied and reviewed in the study. Greening Guidelines on highway structures will be developed for future planning use. On site trials will be

conducted once the study is complete to check the long-term practicality of the recommended greening options.



Greening along Gascoigne Road Flyover



Hanging planter along Arsenal Street Footbridge



Investigation Study for Greening and Aesthetic Design of Noise Barriers

Noise barriers and enclosures are commonly used for roadway noise mitigation. To further improve the general appearance of this particular kind of noise mitigation measures, HyD carried out a study in 2006 on noise barrier aesthetic design practices and greening. Three types of greening measure on noise barriers have been explored and trials have been arranged. They are green walls, earth mound, and planters with climbers. The current progress of the trials of these greening measures is described below;



a) Green Walls:

Green wall comprises a proprietary growing medium sandwiched within vertical meshes to act as noise barrier. A green wall around 180 metres long was completed in June 2007 along the north bound of Kong Sham Western Highway near San Sang San Tsuen. The performance of the growing medium and climbers on the wall is being monitored. Other trial green wall noise barriers have been included in Contracts No. HY/2007/07 and HY/2007/08 for construction along Tseung Kwan O Road and an area along Tsing Tsuen Bridge at Tsing Yi and Tsuen Wan Approaches respectively.



Green wall along Kong Sham Western Highway San Sang San Tsuen

b) Earth Mound:

Earth mound is considered to be effective and aesthetically pleasing as it looks natural, requires minimal maintenance. However, the use of earth mound is generally not common in Hong Kong as it needs more space. An engineered earth mound occupies less space and can still be appropriate for use in some places in Hong Kong. An engineered earth mound in Route 8, Eagle's Nest Tunnel and Associated Works Contract has been completed recently to test its



Route 8 engineered earth mound

effectiveness in traffic noise mitigation and in supporting appropriate greenery to improve the general external appearance. Another earth mound, around 28m long, has also been completed in October 2007 near Yuen Long Highway north bound to Kong Sham Western Highway north bound.



Earth mound along Yuen Long Highway north bound to Kong Sham Western Highway north bound

c) Planters with Climbers:

Planter is provided at the base of noise barriers or retaining wall for planting of vegetation including climbing plants. Supporting frame or cables are mounted on the surface of the wall or noise barriers to facilitate the attachment of the climbing plants. A retaining wall, around 40m long, at Kong Sham Western Highway north bound near Ngau Hom Shek was identified for the trial. The construction works were completed in June, 2007. The whole system is being monitored.



The climbing system along Kong Sham Western Highway north bound near Ngau Hom Shek

Maintenance of Roadside Slope Vegetation

Under Environment, Transport and Works Bureau Technical Circular (Works) No. 2/2004, Highways Department is responsible for the maintenance of vegetation within the boundary of expressways and man-made roadside slopes registered in the "SIMAR" database set up by Lands Department.

The Department maintains vegetation along expressways and on about 10,000 roadside slopes in the territory. Our aim is to keep the vegetated areas in a green, tidy and safe condition. Routine inspections and maintenance operations on the vegetation are carried out every six months. If required, maintenance frequency may be increased for special planting areas.

Maintenance operations include removal of debris and dead trees, weeding, grass cutting, watering, pruning, thinning, fertilizing, pest control and arboricultural treatment, etc. No tree would be unnecessarily felled or pruned. If a tree is inevitably required to be removed for road development, transplanting the tree to another location would be the preferred course of action. The photos below indicate measures used to preserve trees on slopes.



Slope No. 11SW-A/FR135 at Caine Lane – Preservation of existing trees in-situ as part of the slope upgrading works



Clearing of rubbish and improvement planting afterward along slopes on high speed road



Horticultural maintenance – removal of dead tree



Improvement planting work to enhance the landscape setting of the slopes and along expressways will be carried out whenever resources are available. Both native and exotic species are used in harmony to improve the landscape quality of the roadside environment and to achieve a sustainable green setting. In 2007, HyD planted around 12,000 trees and 230,000 palms/shrubs/groundcovers/climbers of which 70% of the plants are native species.



Improvement planting work on slope 6NW-C/C288 along Castle Peak Road - Langnan, Tuen Mun

For the efficient management of slope vegetation, a Slope Vegetation Inventory was completed in 2004 containing information on vegetation grown on individual slopes maintained by HyD. In addition, a register of the valuable trees on slopes has been established and incorporated in the HyD Central Slope Inventory in order that trees requiring special preservation or maintenance measures can be easily identified when any projects/ works affecting a roadside slope are proposed.



Streetscape Enhancement and Greening

Apart from providing a safe and effective road network in Hong Kong, it has also been HyD's goal to provide a green and attractive street environment for pedestrians. Streetscape enhancement work carried out in conjunction with the pedestrianisation schemes in the urban area has been well received by the general public.

Streetscape Enhancement in Urban Area

Streetscape enhancement work, started in 2006 includes upgrading the quality of paving, street furniture, street lighting and incorporation of more greening eg. street trees and/or roadside planter. Work has been carried out in SOHO, Sham Shui Po and Jordan. Footpath widening and improvement were also carried out in Mid-levels including the surrounding area of the newly renovated historic building Kam Tong Hall and converted into the Dr. Sun Yat Sen Museum.



Street enhancement work along SOHO area



Upgraded paving and road side hanging planter along Canton Road

HyD also cooperates with other government departments such as Transport Department and Planning Department on area improvement as well as streetscape and greening upgrading work. This enables a comprehensive upgrading of the streetscape of an area with a coordinated design. The enhancement work will be ongoing from area to area.



Upgraded paving and road side planting along Fenwick Street



Upgraded paving and road side planting along Ashly Road

As the private sector has expressed an eagerness to participate in local street environment improvement work, HyD therefore partners with District Councils, developers and community organizations to carry out streetscape enhancement work. Past examples include the upgrading of the Central District around Hong Kong Landmark initiated by Hong Kong Land Ltd, and the upgrading of Hollywood Road by Henderson Land Ltd. Urban Renewal Authority has also been invited to participate in several of the streetscape enhancement projects in Tsim Sha Tsui and Tai Kok Tsui.



Greening

The Greening Master Plan (GMP) promoted by Civil Engineering and Development Department (CEDD) involves improvement work along public roads and highway structures. Apart from providing necessary advice during the study and design stage of GMP in each district, HyD coordinates with CEDD closely to enable their implementation of the short term measures of the GMP. In general, HyD will upgrade the street paving, lighting and street furniture in tandem with the greening work implemented by CEDD. A recent example is Nathan Road in Tsim Sha Tsui.



Upgraded paving and road side planting along Nathan Road

Use of Reclaimed Asphalt Pavement

Hong Kong generates several types of waste, one of which is construction and demolition materials (C&D materials) arising from activities such as construction, renovation, demolition, land excavation and road works. Although this waste is now separated and inert material is used as fill in reclamation sites when available, a significant portion of the C&D materials still go to landfills. With economic growth and higher expectation in living standards, the volume of C&D materials is on the rise and available landfill space in Hong Kong is fast declining.

Highways Department constructs and maintains the road systems of Hong Kong which generates a substantial quantity of C&D materials every year. As a responsible and environmentally conscious department, it is our continual goal to reduce C&D materials from our day to day activities. One means of reduction is often associated with recycling whenever suitable technology is available.

One source of road work C&D materials comes from periodic resurfacing of the top layer of deteriorated pavement. Resurfacing is being carried out extensively in Hong Kong due to high traffic volume resulting in a very

large quantity of milled surface material being removed and disposed. As the milled material still has certain structural strength when compacted, it has often been re-used in forming the pavement of open air temporary car parks.

Further, re-using the milled material as part of its constituent material, Reclaimed Asphalt Pavement (RAP), has been successfully used in many overseas countries in recent years for road construction. To assist in reduction of waste and recycling of useful material, HyD has decided to recycle this type of resurfacing material and reuse in road construction. In December 2007, about 500 square metres of Pak Tam Road in Sai Kung was constructed using RAP for the first time. Although it may take time for this new application to be widely used in Hong Kong's construction industry, it is expected that this material will be more widely used in future with HyD as the lead user. The use of RAP has been included as a mandatory requirement in the new road maintenance term contract no.11/HY/2007 due to commence on 1 April 2008. We intend to progressively promulgate the mandatory use of RAP to other contracts.



Laying of reclaimed asphalt pavement in Sai Kung

Research & Technology

We continued to focus our research on environmentally friendly technology, such as further development of low noise road surfacing, incorporation of recycled materials into our road pavement, adoption of common utility enclosure to reduce road opening, and improvement in information technology to enhance efficiency and reduce paper wastage.



Low Noise Road Surfacing (LNRS)

Our research on a more durable LNRS continued. The trial of a new type of polymer modified friction course at Chui Tin Street, a local road in Shatin, continued. After 21 months of laying, the best performing trial section still has a noise reduction of 2.5 dB(A) when compared with the original bituminous surfacing. This showed a significant improvement over previous LNRS trials. With a view to benchmarking the noise reduction effect of various types of friction courses on an expressway, trial sections of five different types of friction courses, including the new polymer modified friction course, were laid at the Fanling Highway in September 2007.



Trial of LNRS at Fanling Highway

The traffic noise performances of the sections were measured both before the trial, and after the new friction courses were laid. Noise measurements are regularly carried out by the Hong Kong Polytechnic University, which uses both the roadside measurement method and the close-proximity method to measure the noise level. In addition, the hydraulic conductivity of the sections are also measured. The monitoring period will last for two years and the findings will provide us with more comprehensive noise performance data of the various types of friction courses at high traffic speed.



Drainability Test - for measuring hydraulic conductivity

Close Proximity Method (CPX) - for measuring road/tyre noise level



Recycled Pavement Materials

Recycled Aggregates as Sub-base

Monitoring on the performance of the recycled aggregates used as sub-base in Fo Tan Road continued in 2007. The trial sections of footpath and carriageway using recycled aggregates as sub-base continued to perform satisfactorily. The carriageway pavement constructed with full depth recycled sub-base, composite sub-base and virgin sub-base shown no difference in actual site performance so far. However, it was noted that significant cementation has taken place in the recycled sub-base layer. Long term monitoring is required to assess whether reflective cracking in the asphalt pavement will result from cracking of the cemented sub-base. The footpath with recycled sub-base also showed no difference in actual site performance. The recycled sub-base can be easily excavated with hand tools, and the cementation effect does not affect the ease of excavation. A technical report will be written on the findings of the site trial.

Recycled Aggregates in Precast Concrete Pavers

We have introduced the use of precast concrete pavers made with recycled aggregates since April 2003. Two local manufacturers are now producing such pavers and these are being used on our footpaths. Besides, these pavers are also used in public building projects by Housing Department and Architectural Services Department, and in private developments.

Clean Air Charter

“Every small step taken by each individual to support the clean-air initiatives in our daily lives can help reduce air pollution.”

The Chief Executive, Mr. Donald Tsang



Energy and Emission Management Team

An Energy and Emission Management (EEM) Team was set up in Highways Department in September 2007. Chaired by an Assistant Director with 9 representatives from Regions and other offices, the EEM Team provides support to the implementation of the EEM programme of this department. It is also responsible for the design and implementation of measures to reduce emissions and minimize energy consumption as well as providing training to Highways staff. To facilitate the formulation of energy saving initiatives, the EEM Team has commissioned EMSD to conduct an energy audit covering our offices at Ho Man Tin Government Offices Building in early 2008.

Measures and Achievements of Energy Saving

Energy Saving in Offices

We have continued replacing all T-8 fluorescent tubes with T-5 tubes and maximizing the use of natural lighting and openness in our offices. Further reduction in electricity consumption by means of delamping some of the lamps of the corridors on UG/F to 6/F of the Ho Man Tin Government Offices Building will be implemented in early 2008.

Energy Saving for Public Lighting

In view of the significant electricity consumption of the Public Lighting System, we continued our effort to reduce electricity consumption by improving the efficiency of the street lighting appliances.

In 2007, we have replaced 2,177 nos. of lamps and lanterns by those with lower wattage but higher efficiency. The annual saving of electricity consumption is about 420,000 kWh. The introduction of the trial scheme of replacing 1,026 nos. of electromagnetic ballasts in public road lights with electronic ballasts yielded an annual saving of electricity consumption

of 314,000 kWh. We have also completed the replacement of more than 600 nos. of illuminated subway signs with non-illuminated one resulting in a reduction of 200,000 kWh electricity consumption.

The total annual saving of the electricity consumption generated from the above three measures amounted to 934,000 kWh.

We have reviewed the existing lighting level of some footbridges and found that some may have room for achieving energy efficiency through optimization of the lighting level by installing dimmer (or dimming electronic ballast) while still maintaining the lighting standard. We have planned to install dimmers at 10 footbridges in 2008. If the result is satisfactory, a more comprehensive scheme is to be extended to cover more footbridges.

Energy Saving for Public Transport Interchange Ventilation

We have stipulated the requirement for achieving energy efficiency with respect to ventilation in the Technical Schedule for the design of public transport interchanges (PTI).

To enable natural ventilation and natural lighting, the design of the PTI shall endeavour to achieve a layout with at least two opposite sides of the PTI fully opened to the outdoor ambient without major obstruction, and supplemented with mechanical ventilation if necessary. The entrances and exits for vehicles are also arranged to such locations to enhance movement of air pollutants to avoid their accumulation.

We have also reviewed the performance of the ventilation operation of the PTIs based on the results of air quality measurements conducted by Transport Department. The ventilation system is adjusted to save energy in case the ventilation is over provided.

Renewable Energy Projects

To evaluate the applicability of solar lights for public lighting, trial schemes with installation of 14 nos. solar lights in village / rural areas

were completed in 2007. The estimated annual saving of electricity consumption is 2,800 kWh. Nevertheless, there are limitations such as on the reliability of lighting, high installation costs, need of suitable large open space to receive sunlight. Hence, solar lights are only viable at remote open space where there is less stringent requirement in provision of public lighting.

Energy Saving in Works Projects

We have adopted energy saving equipment in works projects. For instance, under Contract HY/2007/07 – Retrofitting of noise barriers on Tseung Kwan O Road and Contract HY/2007/08 – Retrofitting of Noise Barriers on Tsing Tsuen Bridge at Tsing Yi and Tsuen Wan Approaches, electrical appliances required are those with Energy Efficiency Grade 1 labels under the Energy Efficiency Labeling Scheme.



Air Conditioner which has Energy Efficiency Grade 1, under the Energy Efficiency Labelling Scheme

Measures and Achievements of Air Emission Reduction

Electricity generation accounts for the emission of sulphur dioxide, nitrogen oxides and respirable suspended particulates. Reducing the consumption of electricity through the afore-mentioned energy saving initiatives can directly lead to air emission reduction, hence improving the local air quality.

Reducing the Use of Volatile Organic Compounds

We apply paints to bridge structures to help protect the structure from adverse environmental effect including weathering, chloride, carbonation or sulphate attack; repair the deteriorated paint of the structure; and uplift the appearance of the structure.

We use paints which meet the Volatile Organic Compounds (VOC) limits under the Air Pollution Control (Volatile Organic Compounds) Regulation in Hong Kong. The contents of VOC of all paints used have been controlled under the General Specification Clause 18.16(3) of the new General Specification 2006 which came into effect on 1 September 2007. To be more environmentally friendly, we use water-based paints or solventless paints for land concrete structure wherever conditions permit. All along, we have drawn the attention of our maintenance Terms Contractors about the VOC limits and have impressed upon them that more environmental and low VOC paints should be used as far as possible.

Reducing Air Emission of Vehicles

We have adopted measures in reducing air emission of vehicles including introduction of environmentally friendly Government and contract vehicles. Most of our recent contracts have included provision to use environmentally friendly vehicles. We intend to make it a mandatory requirement that all new works contracts must use environmentally friendly petrol private car type-approved by EPD.



Contract Vehicle which is an environmentally friendly petrol private car model that has been type-approved by EPD

Green Office Management

To sustain a green office environment, we have followed the 3-R principles “Reduce, Reuse and Recycle” in our day-to-day office management.



To sustain a green office environment, we have followed the 3-R principles "Reduce, Reuse and Recycle" in our day-to-day office management. Our Green Committee was first formed in 1994 to develop, implement and monitor green office practices. We endeavor to sustain a green office environment and adopt various green measures in housekeeping to economize the use of natural resources. The main features of the green measures are summarized as follows:

Paper Saving



- Minimize photocopying paper consumption
- Use both sides of paper for printing and photocopying
- Use blank side of used paper for drafting/photocopying for internal reference
- Use electronic means extensively for communication, including the sending of electronic files instead of hard copies
- Reuse envelopes and file covers
- Encourage the use of recycled paper

Energy Saving



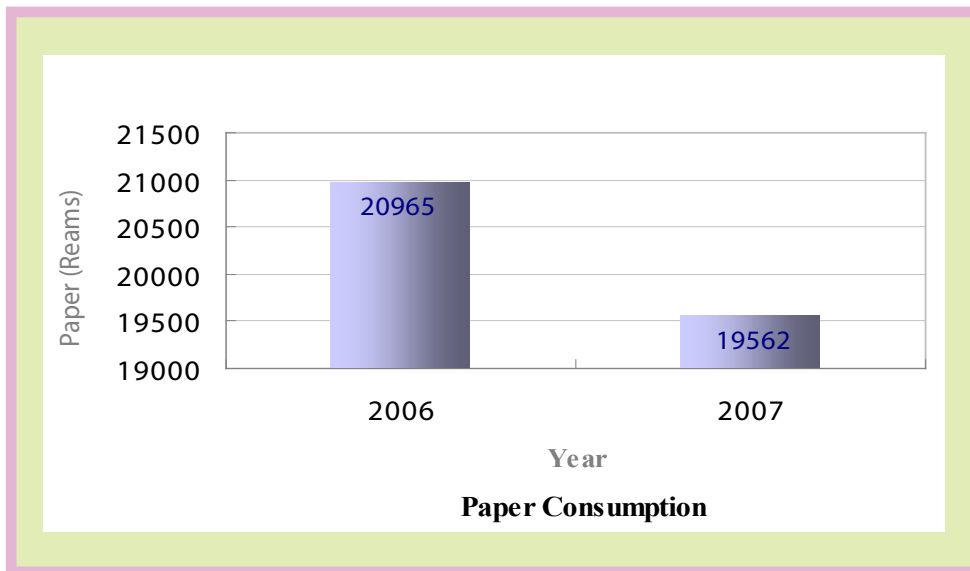
- Appoint Energy Wardens in every Office / Division to monitor lighting
- Maintain air-conditioning not lower than 25.5 °C in summer
- Switch off lights during lunch or when away for long hours
- Switch off computer equipment and electric appliances not in use
- Review lighting level arising from change of room use
- Monitor electricity consumption
- Encourage use of staircase for inter-floor traffic
- Use timer water taps in toilets

Waste Collection for Recycling



- Put up green boxes to collect reusable envelopes and papers for reuse
- Collect computer printer toner and ink cartridges for refill and recycling
- Put up recycling boxes to collect paper, used CD, plastic bottles and aluminum cans for recycling

With the concerted efforts of our staff, we have achieved a saving of 6.7% in paper consumption in 2007 when compared with 2006.



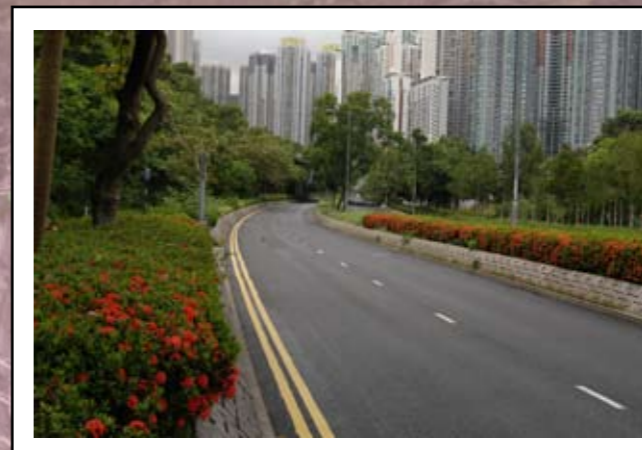
To maintain impetus of green measures in housekeeping, we conduct annual environmental audits in all the 14 offices located in different premises. The objectives of conducting the annual environmental audits are:

- (i) to assess compliance with the green housekeeping guidelines;
- (ii) to identify non-compliances 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.



Environmental Awards

Improve the living standard of our community is our mission.



Environmental Awards

In 2007, we continued to encourage our contractors to participate in territory-wide environmental campaign and award schemes. In 2007, our construction sites were presented with two Outstanding Environmental Management and Performance Grand Awards (OEMPGA) and four Considerate Contractors Site Awards (CCSA) which were organized by the then Environment, Transport and Works Bureau (ETWB) to recognize construction sites with good site safety and environmental performance, and considerate attitude towards the neighbourhood and the public in carrying out the works.



Medal for OEMPGA Gold Award – Route 8 - Eagle's Nest Tunnel and Associated Works



Medal for CCSA Silver Award – Reconstruction of Causeway Bay Flyover and Associated Widening of Victoria Park Road

Hong Kong Flower Show 2007 – Grand Award for Unique Feature (Landscape Display)

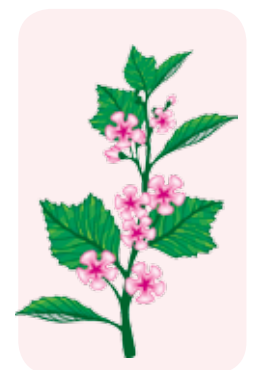
With the support of the department, we have won the Grand Award for Unique Feature (Landscape Display), which is the highest standing of the unique feature group.



To echo with the theme of the Hong Kong Flower Show 2007, 'Spring Blossoms for Celebration', the design has adopted the same concept, which is to celebrate the milestone achievement of Highways Department in the past decade.

Floating on the flowerbed is a pathway formed by 10 stepping-stones separated by silver pebbles. The path has a straight edge with seating benches on one side and an open curving edge facing the flowerbed on the other. This signifies our strong commitment to provide fast and comfortable transport network while allowing a flexible and open approach.

Along the pathway is a series of display panels with our key projects of the past decade set in a chronological order. Standing amongst the flowerbed are 10 stainless steel features with mirror-finish to reflect the surrounding landscape. This symbolizes our effort to integrate every project into the environment in a harmonious manner. At the end of the path is a raised platform signifying our elevated missions for the years ahead including our commitment to environmental protection. The platform is constructed with paving blocks produced from construction waste (recycled aggregate).



The focus of the display is a 4m high bridge (a replica of the cable-stayed bridge with inclined-tower at Hong Kong–Shenzhen Western Corridor) set in a flowering sea spanning between the 2 levels. This reflects our on-going mission to expand the cross-boundary transport facilities between Hong Kong and the Pearl River Delta region for the sake of their continuous prosperity. On top of the colourful theme flowers, silver colour is repeated in both the hardworks and the floral display to reinforce the mood of celebration.

Achievement of Environmental Objectives and Targets and Environmental Targets for 2008

We recognize the importance of sustainable development and have been striving for continual improvement in the protection of environment by setting objectives and targets to improve our environmental performance.



Achievement of Environmental Objectives and Targets

We set environmental management plans yearly with clear objectives & targets.

We are pleased to conclude that most of our targets for 2007 were satisfactorily met.

The achievements are summarized as follows:

Objectives	Targets set for 2007	Achievement (as at 31 Dec 2007)
Implementation of Clean Air Charter initiative	To establish an Energy and Emission Management Team	An Energy and Emission Management Team comprising members from various offices was established in September 2007
Replacement of illuminated subway signs by non-illuminated retro-reflective subway signs with a view to reducing energy consumption	To replace 600 subway signs	Totally 602 subway signs were replaced
Installation of electronic ballasts with a view to reducing energy consumption	To install 2,000 electronic ballasts for road lighting	1,026 electronic ballasts were replaced with the remaining ones to be completed in 2008
Encouraging the use of recycled paper in the Department	To raise the percentage of recycled paper from 88% to 90% of the total consumption	Target was achieved
Better control of electricity usage by office equipment and lighting in individual floors of Ho Man Tin Government Offices where the Departmental Headquarters are located	To install separate electricity meters in individual floors of HMTGO to monitor electricity usage	Separate electricity meters were installed on 1/F to 6/F of HMTGO to monitor electricity usage
Developing low noise surfacing material	To commence a site trial to monitor the noise reduction performance of the new polymer modified bituminous material in expressway	Trial sections were laid in September 2007, and noise monitoring would be carried out for 2 years
Recycling materials	To commence a research study on the suitability and cost effectiveness of using rubber crumb from local scrap tyres in bituminous materials	We commissioned the Hong Kong Polytechnic University to carry out a study on asphalt rubber and asphalt rubber mixtures in June 2007
Planting trees and shrubs	To plant 130,000 trees & 500,000 shrubs under major highway projects	140,000 trees & 1,380,000 shrubs were planted
Heritage preservation (Central Kowloon Route Project)	To commence an investigation study for Central Kowloon Route with particular attention to preservation of built heritage	The investigation study commenced in August 2007 with particular attention to the preservation of built heritage

Environmental Targets for 2008

We always strive for continual improvement and will continue in 2008 to maintain a sustainable environment with more research initiatives, energy saving and greening measures in the protection of environment.

Objectives	Targets
Installation of electronic ballasts with a view to reducing energy consumption	To complete installation of 3,000 electronic ballasts for road lighting
Installation of dimmers at footbridges with a view to reducing energy consumption	To complete installation of dimmers at 10 footbridges
Implementation of Clean Air Charter initiative	Energy and Emission Management Team to arrange an Energy Audit to examine energy consumption equipment in Homantin Government Offices in early 2008 and recommend measures in minimizing energy consumption and reducing emissions
Encouraging the use of recycled paper in the Department	To raise the percentage of recycled paper from 90% to 92% of the total consumption
Further reduction in electricity consumption in individual floors of Homantin Government Offices where the Departmental Headquarters are located	To delamp some of the lamps of the corridors on UG/F to 6/F in early 2008
Recycling materials	To progressively introduce the use of asphalt incorporating reclaimed asphalt pavement in roadworks To complete the study on asphalt rubber and asphalt rubber mixtures
Planting trees and shrubs	To plant 250,000 trees/shrubs in the vicinity of major highway projects
Procuring environmentally-friendly contract vehicle	To procure at least one environmentally-friendly petrol private car model in each of the new major works contracts
Adopting site office equipment with energy saving label	To use site office equipment with energy saving labels in all new major works contracts
Dust emission reduction	To include a particular specification clause for dust suppression in all new major works contracts

We shall make every endeavour to achieve the above targets and hope that this publication will provide you with a glimpse of our efforts in environmental protection. Should you have any comments or suggestions on our work, please share with us your views through our homepage on the Internet (address: <http://www.hyd.gov.hk>). Thank you for reading our report.

