

# Environmental Report 2008



**Highways  
Department**

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## Director's Message



It is my pleasure to present to you our sixth Environmental Report which summarises the efforts we have taken to achieve our environmental goal in 2008 and our environmental targets and initiatives for 2009.

In this report, we share with you our experience on environmental management in capital works projects. We have systematically managed every aspect of our work which may have impact on the environment during the planning, design, tender procurement and construction stages. The environmental planning for "West Island Line" railway project and the air quality assessment for Hong Kong-Shenzhen-Zhuhai Corridor are two examples which will capture your attention. We continue our efforts in greening highway structures. This report has included a new item on "vertical greening" which will be of interest to you.

In 2008, much efforts have been devoted to the streetscape enhancement works for the Olympic and Paralympic Equestrian Events. The enhancement works which, including the laying of colourful paving blocks and improvement of roadside structures in the vicinity of event venues, have added vitality to the community in an environmentally friendly manner.

Besides, we have been actively pursuing research studies on use of recycled materials and reduction of traffic noise.

We are also committed to energy saving and will continue to make our best endeavours to support the clean air initiatives. Five energy management opportunities had been identified in our first energy audit and we had promptly taken effective measures. We have achieved good results in energy saving in public lighting. Following the implementation of three energy saving measures in public lighting, we recorded a significant saving in energy consumption of 627,000 kWh. As from 2008, we adopt the use of paint with low/ no volatile organic compounds (VOC) in all new works contracts. In 2009, we will be more proactive in implementing energy saving initiatives. For instance, we will carry out trials with a view to adopting renewable energy technologies in our new capital works projects.

Notwithstanding our efforts made in 2008, we will 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 black ink, appearing to read 'Wai Chi-sing'.

WAI Chi-sing  
Director of Highways  
June 2009

## About this Report

This report covers the period from 1 January 2008 to 31 December 2008. It shows the environmental awareness of our work and our efforts in environmental management in capital works projects, sustainable asset management, research and technology, Clean Air Charter, and green office management. Environmental awards, achievement of environmental objectives and targets for 2008 and environmental targets for 2009 are also covered in this report.

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

## 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 various activities associated with implementation of new railway projects;
- providing design input for road lighting, highway 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 (HMTGO), with sub-offices in North Point Government Offices (NPGO), Cheung Shan Wan Government Offices (CSWGO), Cheung Sha Wan Plaza, Skyline Tower and Nan Fung Commercial Centre in Kowloon Bay. We have an establishment of about 450 professional staff and 1,600 technical and general grades staff. We maintain about 2,040 km of roads and 12,600 roadside slopes within the territory. The total operating expenditure for the financial year 2008/09 is \$2,140 million.

## Environmental Goal

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

## Environmental Policy

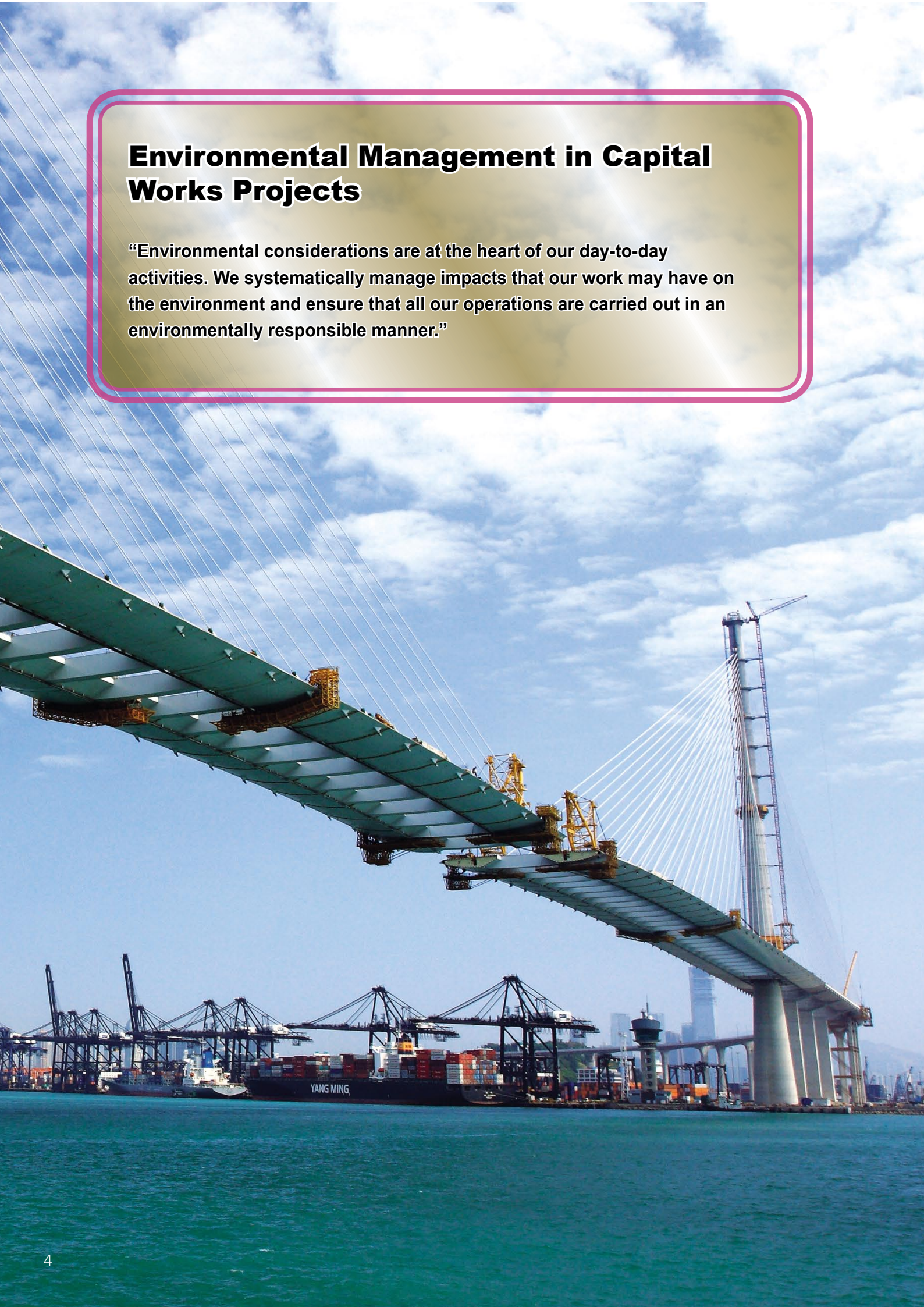
Our policy on protection of the environment has been integrated into our Department's Management Policy with its latest version promulgated in April 2009. We are committed to sustainable construction with due consideration to balancing environmental, social and economic needs. To achieve the goal of 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 and controlling the environmental aspects at all stages of our work;**
- **using resources efficiently, minimizing waste and preventing pollution as far as practicable;**
- **monitoring the performance of our contractors to ensure good quality of works and to prevent or mitigate potential environmental impacts arising from our projects;**
- **complying with relevant legal and other requirements; and**
- **identifying opportunities for continual improvement.**



## **Environmental Management in Capital Works Projects**

**“Environmental considerations are at the heart of our day-to-day activities. We systematically manage impacts that our work may have on the environment and ensure that all our operations are carried out in an environmentally responsible manner.”**





## Planning and Design Stage

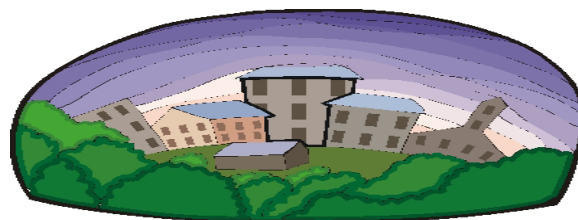
In delivering a new road or railway project, we identify at the planning stage the environmentally sensitive areas and try to avoid impacts on the environment. We set up operational controls on the significant aspects and devise mitigation measures incorporated into the project documents at the design stage.

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 covers an assessment on a wide range of environmental aspects such as noise, air and water pollution; landscape and visual; ecology, cultural heritage and archaeology during both the construction and operation stages of the project. It identifies the impact sources, community sectors likely to be affected, and determines the severity of impacts. Should any adverse impact be identified, we will devise measures to avoid it or to mitigate it to an acceptable level.



### Environmental Planning for West Island Line

West Island Line (WIL), an extension to the existing Mass Transit Railway (MTR) Island Line from Sheung Wan to Kennedy Town in the Western District, is a railway project under active planning. It will provide a form of mass transportation rail service that is more environmentally friendly than road-based alternatives, as confirmed in the Strategic Environmental Assessment for the Second Railway Development Study completed in year 2000.



### Improving the overall environmental quality of Western District

The proposed railway line will provide a fast, convenient and reliable means of public transport between Sheung Wan and Kennedy Town. It will enable residents in Western District to have direct access to the MTR network, saving time for interchange from road transport to railway network. In particular, the promotion of rail service contributes towards achieving an overall sustainable transportation system. From efficiency and environmental viewpoints, the use of emission free and electrically powered trains operating underground is particularly suitable. As Western District has been fully developed, there are serious constraints in constructing any new roads or widening existing ones to alleviate traffic congestion. An underground railway is a more feasible way to improve traffic conditions in the district.

With WIL, the existing heavily-loaded road networks could be freed up. Such reduced road traffic would result in overall improved traffic flows at the Western District as well as helping to reduce vehicular noise and air emissions in the area. Furthermore, as the entire WIL will be underground, the need for erecting noise barriers and enclosures could be avoided. Given the deep underground tunnel, ground-borne train noise impacts would be minor and could be reduced to acceptable levels. Hence, the overall environmental quality of the Western District will be improved.

### Environmental considerations of WIL

WIL is a Designated Project within the scope of the EIAO. Environmental impacts such as issues related to airborne noises, ground-borne noises, landscape and visual

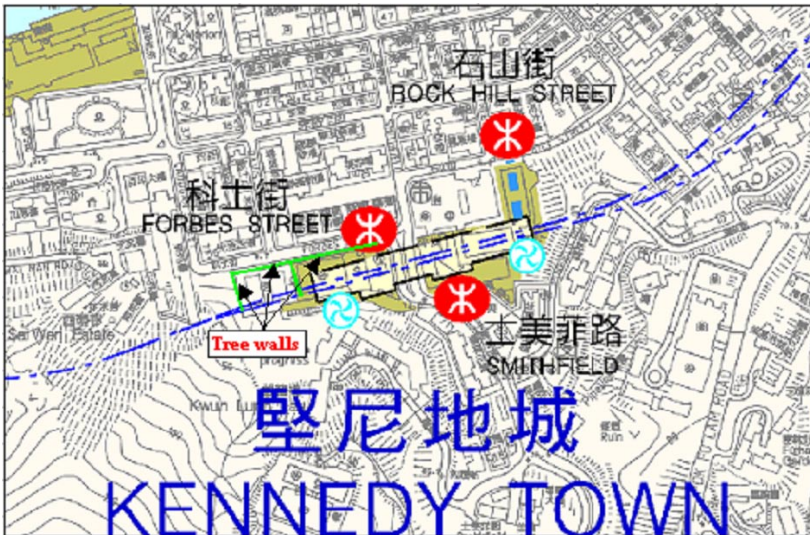
aspects, cultural heritage, waste management, water and air quality etc. were all carefully considered. Part of the assessment was on measures to avoid or to reduce the impacts to acceptable levels. The Environmental Impact Assessment Report of the project was exhibited for public's comment in late 2008 and approved by the Director of Environmental Protection on 23 December 2008.

Western tall segment of Tree Wall along Forbes Street



Tree Wall along Forbes Street looking west

Extensive public consultation has been conducted during the preliminary design of the Project. The public generally welcome and look forward to the early implementation of WIL. However, during public consultation, it is noted that a key public concern on landscape and visual issues was the



Tree Wall near Kennedy Town Station

need to preserve the tree walls in the Kennedy Town Playground along Forbes Street. In response, the cut and cover Kennedy Town Station is deliberately located as far to the east as the topography permits and by adopting a radical internal station design the length of the station is minimized, thus avoiding disturbance to the tree walls.

On the cultural heritage side, all Declared Monuments and graded historical buildings within the Project boundary were identified at the early stage of the preliminary design. The sites identified include five Declared Monuments (such as the Western Market and the exterior of the Main Building of the University of Hong Kong), seventeen graded historical buildings as well as buildings and structures that are not yet graded but of high architectural and historical significance. This enables the project to be designed to avoid causing direct physical impacts on these heritage resources. Furthermore, vibration impacts resulted from construction activities such as tunnel boring or blasting are taken into account, and control and monitoring measures will be imposed to ensure no adverse impacts on these structures will arise.



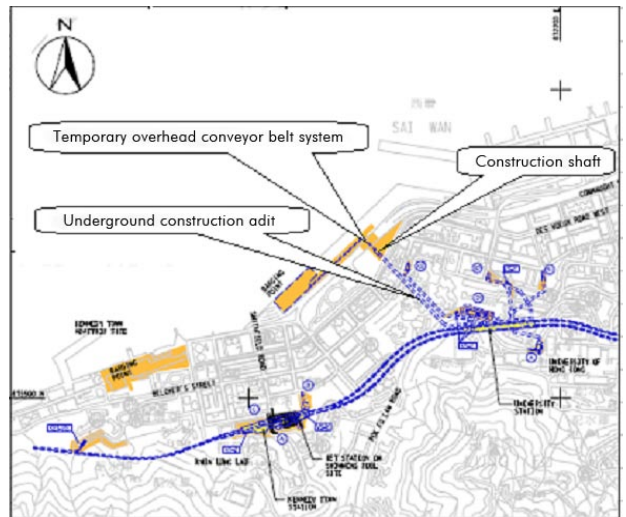
Main Building of the University of Hong Kong



Western Market at 323, Des Voeux Road Central



As for the construction of the WIL, waste management is a major environmental concern since disposal of large quantities of excavated materials could have serious traffic and environmental implications to the already congested and built-up area. In order to reduce adverse impacts to local roads near the Belcher's Garden, a specially constructed adit and a vertical shaft are planned for transporting muck underground with the shaft located as near as possible to the barging point. This arrangement is to shift the excavated materials along the underground adit, up the vertical shaft and into an enclosed conveyor belt system leading to the barging point at the Western Public Cargo Working Areas, thereby avoiding or reducing considerably the impacts to the local roads due to haulage. The intention is to use barges for transporting most of the surplus excavated materials off site by sea.



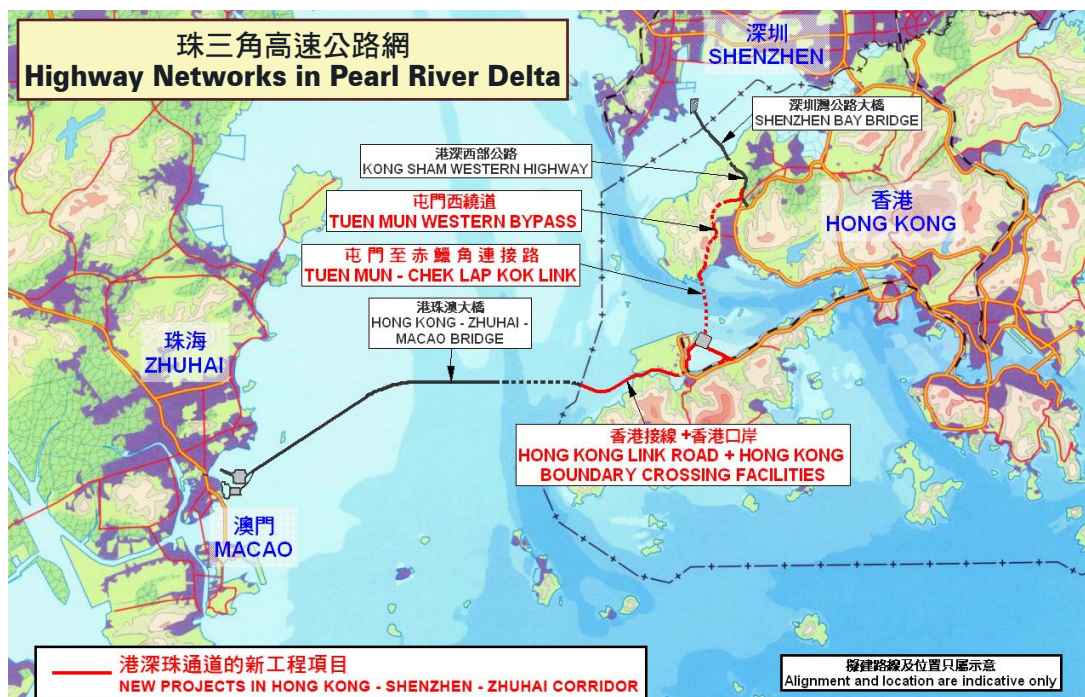
*Mucking System between University Station and Barging Point*

Other noise control measures include the use of quieter construction methods and equipment such as movable and temporary noise barriers, full enclosure, noise insulating fabric, acoustic enclosure, noise insulating cover or decking over excavation areas.

### Air Quality Assessment for Hong Kong – Shenzhen – Zhuhai Corridor

The Hong Kong–Shenzhen–Zhuhai Corridor consists of four new main projects for the part within Hong Kong, namely the Hong Kong Link Road (HKLR), the Hong Kong Boundary Crossing Facilities (HKBCF), the Tuen Mun – Chek Lap Kok Link (TMCLKL) and the Tuen Mun Western Bypass.

Three of the four projects, namely HKLR, HKBCF and TMCLKL, are closely related. It is envisaged that these infrastructure projects will start construction within similar timeframe in 2010/2011 for completion in 2016. The environmental impact assessment (EIA) such as air quality impact assessment arising from these projects is considered in a holistic manner. They are classified as designated projects under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO). In



accordance with the requirements of EIAO, project profiles for the respective projects were submitted to Environmental Protection Department for the application of EIA Study Briefs, which were subsequently issued to us for carrying out of the EIA studies.

The air quality impact assessment, forming part of the EIA studies, shall make reference to the Air Pollution Control Ordinance (APCO) and the relevant standards /guidelines. Groundwork and data preparation for the air quality assessment model has commenced since the fourth quarter of 2008. It is anticipated that the EIA Reports will be submitted for approval and public exhibition under the EIAO in mid 2009. With reference to the EIA Study Briefs, the study area for air quality impact assessment should generally be defined by a distance of 500m from the boundary of the project site. Furthermore, it should be extended to include major emission sources that may have a bearing on the environmental acceptability of the project. The study will also review the air quality impacts on the areas and other sensitive receivers such as Tung Chung New Town, which may be potentially affected by the project.

For operational air quality assessment, nitrogen dioxide (NO<sub>2</sub>) and respirable suspended particulates (RSP) are the traffic air pollutants of primary concern and will be assessed along with other Air Quality Objectives (AQO) under the APCO.

### Prediction of Cumulative Air Quality Impacts

The cumulative air quality impacts would be obtained by summing up for each hour the predicted concentrations of

- background air quality from sources including those in the Pearl River Delta Economic Zone, Chek Lap Kok Airport, roads beyond Lantau and power plants in Hong Kong Special Administrative Region;
- open road traffic emissions; and
- emissions from vehicles at the holding areas of the boundary crossing facilities, tunnel portals and ventilation buildings.

The worst-case concentrations would then be calculated at each of the identified air sensitive receivers to check for compliance with the respective AQO.

### Reclamation Design for Hong Kong Boundary Crossing Facilities

The Hong Kong Boundary Crossing Facilities (HKBCF) project involves 130 ha of reclamation to provide land for the HKBCF development. Under the planning and design stage, we have been exploring different reclamation methods to minimise the dredging/disposal of the marine sediments and to maximise the use of public fills provided that the programme of the HKBCF project can tally with the commissioning date for the Hong Kong-Zhuhai-Macao Bridge. The preliminary reclamation design for the HKBCF being currently considered involves a mixture of the fully dredged and non-dredged methods (such as the drained method with band drains). We will continue to review and refine the reclamation design to minimise the impact on our environment.

### Heritage Preservation for Central Kowloon Route

The proposed Central Kowloon Route (CKR) is a dual 3-lane trunk road across Central Kowloon linking West Kowloon in the west and the proposed Kai Tak Development in the east.

The investigation study for CKR has completed its assessment on various alignment options and impacts to the Yau Ma Tei Police Station which is a Grade III historic building. An



*Old Wing of Police Station: Identified as a building of high significance*

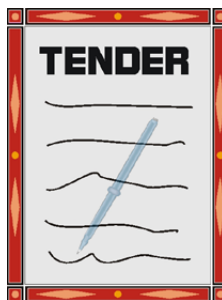
alignment has been selected to avoid demolition of the Police Station.

A conservation study for the Police Station is being conducted to identify its values and to formulate guidelines on conservation. A built heritage impact assessment is also underway to examine any direct or indirect impacts by CKR and to recommend appropriate mitigation measures for the Police Station as well as other heritage areas adjacent to CKR.

## Tender Procurement Stage

### Incorporation of environment-related clauses into the tender documents

In addition to incorporation of relevant standard environment-related clauses promulgated by the Bureau into tender documents, special measures required to be carried out by the contractor are also included. These environment-related requirements include the following:



- vehicles for the Engineer shall be equipped with engines propelled by hybrid of petrol-electricity, or any other non-fossil fuels if appropriate;
- 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;
- wheel washing facilities shall be provided for sites involving considerable earthworks;
- dump trucks carrying dusty materials shall be fitted with mechanical covers to cover the dump bed;
- Quality Powered Mechanical Equipment (QPME) shall be used where appropriate;

- on-site sorting of construction and demolition (C&D) materials shall be adopted where appropriate; and
- recycled aggregates shall be used wherever possible in concrete production, construction of road sub-base and concrete paving units.

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 so that the contractors can 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 tenders, extra credits will be given to tenderers who propose better environmental production measures in their technical proposals.

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

## Construction Stage

### Environmental management in construction sites

Under the "Pay for Safety and Environment Scheme", our contractors are required to prepare and implement Environmental Management Plans comprising waste management and abatement of environmental nuisances on construction sites in the aspects of air, noise, water and wastewater.



We require our contractors to put effort on environmental management through:

- discussing environmental issues at the monthly Site Safety and Environmental Management Committee Meeting chaired by the Engineer’s Representative;
  - attending weekly environmental walks jointly conducted by the contractor and the Engineer’s Representative;
  - ensuring regular site audits and monitoring being conducted by Environmental Team and Independent Environmental Checker; and
  - that the environmental issues are covered at site-specific induction training and tool box talks.
- implementing contract provisions to require contractors to install mechanical covers on dump trucks carrying dusty materials leaving the construction sites; and
  - incorporating an incentive clause in contracts on the use of QPME-typed asphalt pavers, road rollers and vibratory rollers for road works under two maintenance term contracts. Adopting QPME-typed construction plant will reduce the sound level generated from the works and hence environmental nuisance to the surroundings.

In 2008, we stepped up environmental control measures through:

Some of the environmental nuisance abatement measures carried out on site by our contractors are illustrated below:

**Noise**



*Use of enclosure for noisy road works*



*Use of Quality Powered Mechanical Equipment – typed vibratory roller*

種類	道路工程機械
Type	Roller, vibratory
製造商 / 商標	Dynapac
Manufacturer / Trade Name	Dynapac
型號	DC222HF
Model	DC222HF
編號	51711995
Serial Number	51711995
聲功率級	106 分貝(A)
Sound Power Level	106 dB(A)
註冊號碼	EPD-00104
QPME ID Code	EPD-00104
由環境保護署發出	
Issued by Environmental Protection Department	

**Water**



*Sedimentation tanks*



*Keeping site tidy by providing sanitary facilities*



## Waste



*Chemical waste storage*



*Waste collection bins for different categories of wastes*



*Drip tray underneath containers to prevent spillage*

## Air



*Providing cover for open stockpile*



*Dump truck fitted with automatic cover*



*Water spraying for dust suppression*

## Monitoring of contractors' performance on environmental protection

Our Department implements the Environmental Management System certified to ISO 14001:2004. The contractors' environmental performance and their compliance with environmental requirements including those under various legislations are regularly checked and monitored.

We monitor the environmental performance of our contractors by means of:

- attending environmental inspections;
- conducting site checks by Engineer's Representative or his site supervisory staff in monitoring the trip ticket system;
- conducting spot checks by site supervisory staff to ensure that vehicles carrying dusty material are properly and securely covered before leaving construction sites;
- carrying out task-oriented audits to assess effectiveness of contractors' performance in controlling mosquito breeding on construction sites and compliance with legislative and other requirements; and
- reflecting contractors' performance on environmental protection in the Contractor's Performance Report.

## Environmental Training

The Department provides necessary environmental training for all staff. Staff newly posted to the Department would first receive relevant awareness courses so as to grasp a better understanding of the principles and operational requirements of the Environmental Management System (EMS) covering ISO 14001 in a short time. We also commissioned training on 2-day EMS Internal Auditor courses for staff who were required to serve as internal auditors.

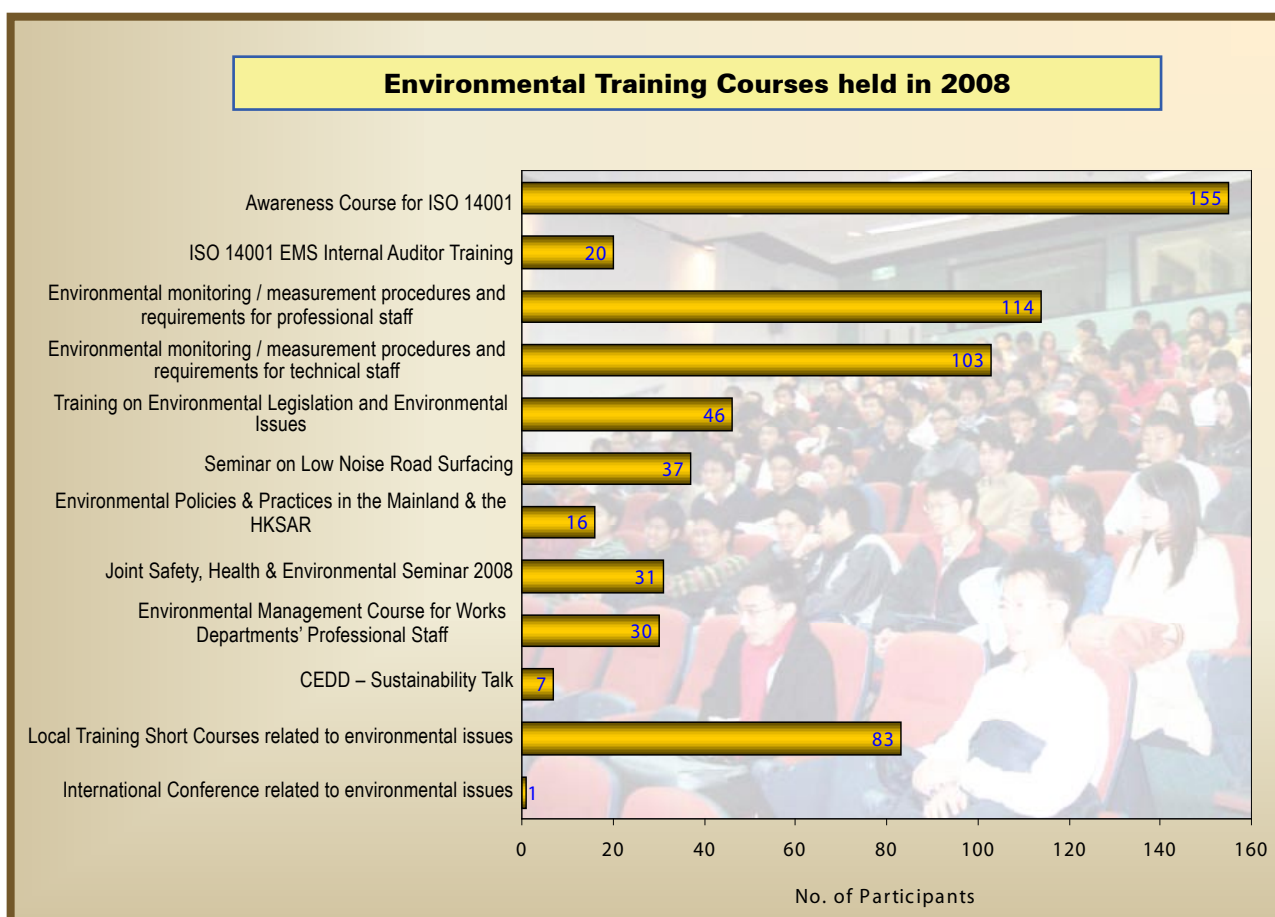
Adequate training opportunities on environmental monitoring procedures and checking requirements under the department's EMS were provided to frontline staff. Latest changes in handling and reporting of identified non-compliance with legal requirements were also included in the training. Our professional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

The Department uses the computer software "RoadNoise 2000" for the assessment of road traffic noise and design of noise barrier. Users were provided with relevant training including EPD's requirement on noise assessment method so that they could get hands-on experience of using the software.



To equip our staff with better knowledge on environmental management measures including abatement of environmental nuisances and reduction of construction and demolition materials in construction sites, we arranged our professional staff to attend the Environmental Management Course for Works Departments.

Our staff were also encouraged to attend relevant local short courses related to environmental issues such as urban sustainability, reclamation and harbour planning, low noise road surfacing, climate change, conserving city heritage, etc. The Department also sponsored some professional staff to attend relevant postgraduate courses to gain more in-depth and up-to-date knowledge on environmental management and conservation.







## **Sustainable Asset Management**

The blending of natural law and human endeavor is the essence of sustainable asset management.



## Use of Reclaimed Asphalt Pavement for Road Maintenance

Although construction and demolition (C&D) 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 goes to landfills. With economic growth and higher expectation in living standard, 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 public road system of Hong Kong which generates a substantial quantity of C&D materials each year. As a responsible and environmentally conscious department, it is our continual goal to reduce C&D materials generated from our day to day activities. A common means of waste reduction is recycling of the materials where possible.

The use of Reclaimed Asphalt Pavement (RAP) in road construction, which incorporates

milled off bituminous surfacing material as part of its constituents, has been successfully adopted in many overseas countries in recent years. To assist in reduction of waste and saving of useful materials, HyD has decided to recycle this type of surfacing material for reuse in road construction. In December 2007, about 500 square meters of Pak Tam Road in Sai Kung was reconstructed using RAP for the first time. Then the use of RAP was included as a mandatory requirement in the road maintenance contract no.11/HY/2007 commenced on 1 April 2008 for maintenance of high-speed road pavement in the NT West. For bituminous materials including road base, base course and wearing course, the contractor is required to use RAP in the range of 10% to 15% by mass of the total mix. There is also a mandatory requirement in the new road maintenance contracts commencing 1 April 2009 - nos. 07/HY/2008 (road maintenance in the Kowloon East districts) and 08/HY/2008 (maintenance of local road pavement in the NT West) to use RAP. We intend to progressively extend the mandatory use of RAP to other contracts and also to increase the percentage of its use.



*Milling of deteriorated pavement*



*Mixing of RAP material with virgin asphalt pavement in plant*



*Laying of asphalt pavement with RAP material*



*Steel rolling of asphalt pavement with RAP material*



*Final rubber rolling of asphalt pavement with RAP material*



*Works completed*

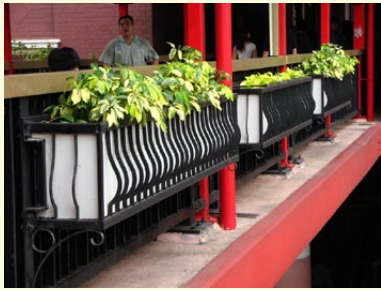


North Lantau Expressway with wearing course incorporating RAP laid under conventional polymer modified friction course



## Greening on Highway Structures

A study to investigate the feasibility of providing more greenery to highway structures has been carried out to provide guidance to designers on possible greening treatments to new road structures, such as footbridge decks, structure roofs, columns and piers, in a safe, maintenance friendly, and cost effective manner.



Footbridge between Western Market and Shun Tak Centre, Sheung Wan, Hong Kong



Footbridge at Po Kong Village Road, Kowloon

The experience learnt from 4 overseas countries hopefully will inspire Hong Kong to plan for future greenery treatment to road structures. However, retrofitting of greenery treatment to existing road structures would largely be constrained by safety and maintenance considerations.



Footbridge linking to IFC, Central, Hong Kong



Footbridge near Science Museum Path, Tsim Sha Tsui

In light of the study finding, greenery treatments are being widely applied to the at grade level components of existing road structures, such as piers and columns. After completion of the study, greening guidelines on highway structure will be developed for application of greening options on existing and future public road structures and trials would be carried out to verify the practicality of the recommended greening options.



Flyover above Tsuen Wan Park



## Vertical Greening

Land is the most precious and limited resource in Hong Kong. Promotion of vertical greening on highway structures is therefore one of our main greening objectives. An in-house Task Force with representatives from the two Regional Offices, Bridges and Structures Division and Landscape Unit (LU) was set up in April 2008 to expedite the progress of vertical greening. A total of 48 numbers of sites were selected for trial under three batches. Fourteen numbers of trial sites under the first batch were completed in the 4th quarter of 2008. The remaining trial sites will be completed in the 1st and 2nd quarters of 2009 respectively. Vertical greening will also be investigated under major works projects to encourage the development of more competitive designs and cost-effective solutions. Besides, an Inventory of Vertical Greening on Highway Structures was uploaded in October 2008 in LU's BBS of HyD's intranet.



*Kwai Chung Road*



*Sha Lek Highway*

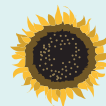
## Greening of Noise Barriers

The trial use of green wall and planters with climbers along the north bound of Kong Sham Western Highway at San Sang San Tsuen and Ngau Hom Shek sections, and the earth mounds at Yuen Long Highway and Route 8 near Eagle's Nest Tunnel were completed. The greening improves aesthetics of noise barriers and blends the latter into the surroundings.

Further trials of green wall noise barriers have been included in Contracts No. HY/2007/07, HY/2007/08 and HY/2009/04 (contracts respectively in Tseung Kwan O Road, Tsing Yi/ Tsuen Wan and Fanling Highway). Construction works for the first two contracts are in progress. The works on Fanling Highway are scheduled to commence in September 2009.



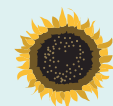
*Earth mound along Yuen Long Highway north bound to Kong Sham Western Highway north bound*



*Green Wall along Kong Sham Western Highway at San Sang San Tsuen*



*Route 8 engineered earth mound*



## Maintenance of Roadside Vegetation

Highways Department is responsible for the maintenance of vegetation within the boundary of expressways and on man-made roadside slopes under our control registered in the "SIMAR" database set up by Lands Department. We are now maintaining about 1,000 hectare of vegetation. 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 is increased for specific planting areas.

Maintenance operations include removal of debris and dead trees, weeding, grass cutting, watering, pruning, thinning, fertilizing, pest control and arboricultural treatment, etc.

Improvement planting work to enhance the landscape setting of the slopes and verges along expressways will be carried out whenever resources are available. Native and exotic species are used in harmony to improve the landscape quality of the roadside environment and to achieve a sustainable green setting.



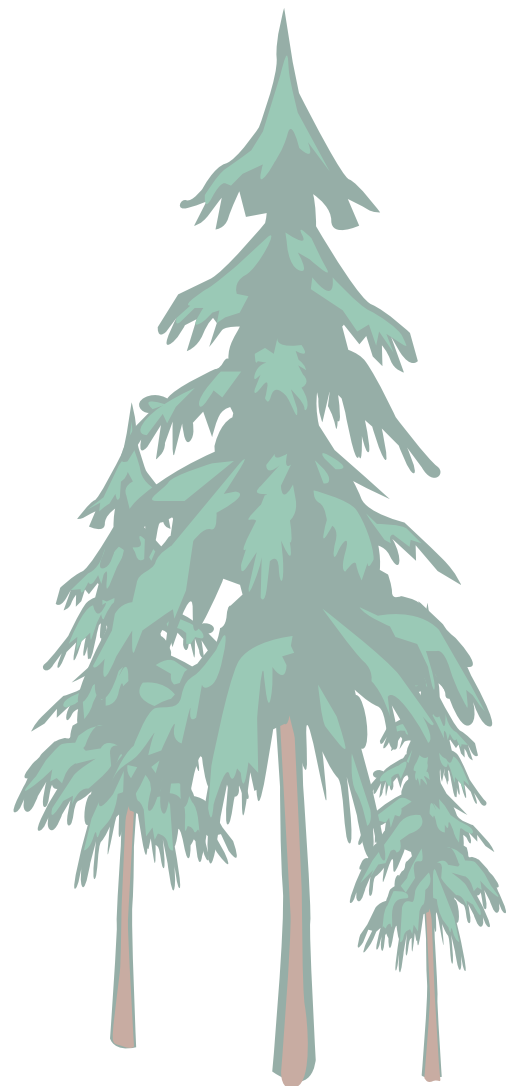
Planting works at new toe wall planter at slope no. 5SE-C/C79, Lung Mun Road, Tuen Mun



Felling of dead tree – 12NW-C/C100 at Clear Water Bay Road, Sai Kung



Improvement planting works – 8 NW-C/C1 at Sai Sha Road, Sai Kung



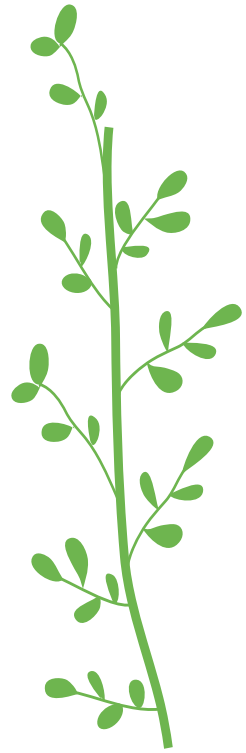




*Planting shade tolerant shrubs and groundcovers to improve the green setting at Lung Poon Street*



*Improvement planting works at Tolo Highway to green the originally bare central dividers*



### **Guidelines on Tree Transplanting**

An in-house Task Force was set up in May 2008 to review the current practices of tree transplanting that falls within the vegetation maintenance ambit of HyD. The scope of work of the task force included reviewing criteria for transplanting, requirements for accommodating transplanted trees within vegetative area maintained by Highways Department, measures to avoid excessive pruning, related contract documentation, supervision arrangement and staff training. A set of interim guidelines for tree transplanting works under Highways Department's vegetation maintenance ambit was promulgated and posted in the HyD Intranet in December 2008.



*Tree Transplanting Works at Lung Mei Village, Tai Po*

## Streetscape Enhancement and Community Planting

### Streetscape Enhancement Works for the Olympic and Paralympic Equestrian Events

It was the first time ever for the Hong Kong SAR to co-host the Olympic and Paralympic Equestrian Events. The design and construction of the streetscape enhancement works arising from these memorable events were jointly undertaken by the Headquarters of Highways Department, the New Territories Regional Office, Bridges and Structures Division, Works Division, Lighting Division and Landscape Unit. The planning and design work started in early 2007.

#### Conceptual Design

Highways Department obtained the approval from the Beijing Organizing Committee for the Games of the XXIX Olympiad to incorporate permanently

the patented Olympic and Paralympic Equestrian pictograms into the mud-red clay paving blocks which have all along been in use in Sha Tin so as to instil the Olympic spirit into



the community of Sha Tin and to commemorate the spectacular international events. The paving blocks with its directional feature pointing to the main venue also functioned as a guiding light for participants in the Olympic equestrian events on competition days.



#### Streetscape Enhancement Works for the Main Venue

The main venue was located at the former site of the Hong Kong Sports Institute near Yuen Wo Road Fire Station and Fo Tan River.

The original footpath was a dark tarmac road. The seating and the pergolas were well worn as they had been in use for more than two decades.



Upon completion of the enhancement works, colourful paving blocks were laid on the footpath together with the original granite paving blocks to produce a pattern that gave more vitality to the footpath in an environmentally friendly manner. As shown in the photographs, the new seating and pergolas were streamlined in design with colours that integrated perfectly with the paving blocks. The lamp posts were painted in mud-red to match with the colour of the paving blocks. Whilst the facelift made the bank of Shing Mun River a more pleasant leisure area, the unique paving slabs containing the pictograms of the Olympic and Paralympic Equestrian Events served as a vivid reminder of Hong Kong SAR co-hosting the spectacular events.

The metallic posts originally erected along the roadside to prevent vehicles from parking on the footpaths were replaced with granite posts to echo, in terms of materials and texture, with the granite pictograms. Unique street lightings were also installed to replace the old ones for decoration purpose. The aforesaid enhancement works greatly improved the streetscape of the entire section of Yuen Wo Road and created an exciting Olympic atmosphere for spectators





of the Olympic equestrian events as well as residents of Sha Tin.

### Streetscape Enhancement Works to the Public Transport Interchange

The government had borrowed from the Chinese University of Hong Kong a piece of land with an area of more than 10,000 square metres to the left of the MTR University Station for the construction of a temporary public transport interchange that provided feeder bus services to the events venues. The pictograms of the Olympic and Paralympic Equestrian



Events were also featured in the enhancement works carried out on the footpath of the temporary public transport interchange. As the alignment of the footpath was oval in shape, resembling the Sha Tin Racecourse, dozens of paving slabs bearing the pictograms were laid along the footpath to remind passengers waiting for the shuttle buses of horse racing on the events.



*A night view of the public transport interchange*

### Streetscape Enhancement Works in the Vicinity of the Olympic Village

Serving as the Olympic Village for athletes, the Royal Park Hotel was conveniently located in the Sha Tin Town Centre, with Sha Tin Park and New Town Plaza nearby. Enhancement works mainly involved replacing paving blocks on the pavements along Yi Ching Lane and Pak Hok Ting Street. The complexity of the works was comparable to those carried out adjoining to the main venue as the repaving works had to be compatible with both the design of the engineering works adopted in the vicinity of the hotel, and of facilities upgraded by the Transport Department to improve traffic flow. The photos below show the streetscape of the Olympic Village after the enhancement works.



The Regal Riverside Hotel on Tai Chung Kiu Road provided accommodation for journalists during the Equestrian Events. A facelift to the area was



necessary as the concrete pavements nearby had already been in use for many years and the cycle tracks in the vicinity had not been resurfaced for a long time. Upon completion of the enhancement works, the concrete pavements nearby were re-paved with vivid-coloured paving blocks whilst the bicycle tracks were resurfaced with a red colour coating. As the advertisement of the hotel said, the area would become a SOHO district in Sha Tin.

## Enhancement of Roadside Structures

Enhancement works were also carried out to improve roadside structures such as footbridges, pedestrian subways and vehicular bridges in Sha Tin. Gone were the days when the colours of these structures were limited to different shades of grey. The introduction of



Footbridge across Tai Po Road near Fung Wo Lane



Pedestrian subway across Tai Chung Kiu Road near Sha Tin Rural Committee Road

new colours that toned in with the surrounding buildings and environment allowed the footbridges, pedestrian subways and vehicular bridges to blend in with the surrounding environment, making the streetscape all the more pleasant for road users.

## Community Planting

Two community planting activities, namely “Community Planting for Route 8 – Lai Chi Kok Viaduct and Eagle’s Nest Tunnel” and “Community Planting for Route 8 - Nam Wan Tunnel and Tsing Yi Viaduct”, were held on 16 February and 24 May 2008 respectively.

All the officiating guests including Chairmen and Councilors of relevant district councils and their transport sub-committee, principals from the schools participating in the community planting and participants such as teachers, pupils and their parents from nearby primary schools and residents enjoyed the planting activities that provided valuable contributions to the greening of environment, in particular to their own district.

### Community Planting for Route 8 – Lai Chi Kok Viaduct and Eagle’s Nest Tunnel





## Community Planting for Route 8 - Nam Wan Tunnel and Tsing Yi Viaduct



### Reducing Lighting Trespass from Street Lights

We are aware of increasing public concern on light trespass from some wall-mounted street lights into windows of residential buildings and have endeavored to implement improvement measures to reduce such nuisance. We conducted a site survey in the last quarter of 2008 and found that, out of about 1,100 nos. wall-mounted lights on residential buildings, about 720 nos. were close to windows. Now, 350 nos. are provided with light trespass reducing features such as cut-off type lanterns / light shields. We shall continue to implement improvement measures for the remaining 370 street lights, including replacing existing lanterns by more efficient cut-off type lanterns, installing light shields or relocating the wall-mounted street lights, depending on different site situations. We expect that the improvement works can be completed in 2009.



*Wall-mounted light with cutoff lantern*



*Wall-mounted light with shield*





## **Research and Technology**

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



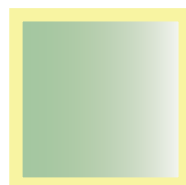
## Low Noise Road Surfacing (LNRS)

Our trial on the new polymer modified friction course material at Chui Tin Street, a local road in Shatin, continued. After 24 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. In view of the encouraging results, the noise measurement will continue for another two years to further monitor the change in noise

reduction performance with time. The noise performance benchmarking exercise of the various types of friction courses at the Fanling Highway continued. The traffic noise at the trial sections is regularly measured using both the statistical pass-by method and the close-proximity method. In addition, the hydraulic conductivity of the sections is also measured. The results from the first year monitoring indicate that the thicker layer of the new polymer modified friction course provides the quietest surfacing.



*Noise measurement at Chui Tin Street*



## Recycled Materials

### Recycled Aggregates as Sub-base

We continue monitoring the performance of the sections of Fo Tan Road where sub-base comprising recycled aggregates has been used. The trial sections of footpath and carriageway are still performing satisfactorily. We continue our long term monitoring so as to assess whether reflective cracking in the asphalt pavement will occur owing to cracking of the cemented sub-base.

### Study on Asphalt Rubber (AR)

Our study on the performance of AR mixtures under laboratory tests has been completed. The results indicate that AR mixtures are more durable when compared with conventional bituminous mixtures, but less durable than a similar mixture incorporating a pre-blended polymer modified binder. To assess the on-site performance of the materials, we are planning to conduct further tests on the alternative asphalt mixtures after an accelerated pavement testing facility becomes locally available in 2009.

### Paving Blocks with Recycled Glass

Waste glass cullet can be used to substitute part of the aggregates in concrete paving blocks. We have laid a trial section of public footpath at Wang Kwong Road, Kowloon Bay using such paving blocks. The site performance of the paving blocks with recycled glass will be monitored for a period of one year.



*Paving blocks with glass at Wang Kwong Road*

## Thermal Patcher

We have carried out site trials in 2008 on using a thermal patcher to perform minor asphalt pavement repair works. The performance of patching was found satisfactory. The thermal patcher is a machine with a heating panel that can heat up and soften the asphalt pavement surface through infra-red radiation. The pavement surface material is ploughed loose as it reaches a suitable working temperature range. With the mixing of a small amount of new asphalt material, the pavement surface can be compacted by roller to complete the





repair. This method reduces construction noise by eliminating the need to break up the pavement with conventional construction equipment, and can re-use the existing asphalt material. It is suitable for minor asphalt pavement maintenance, such as repairing small depressions and surface cracks. The equipment is now used in the two new road maintenance contracts commenced in April 2009.



## Common Utility Enclosure (CUE)

We have resolved outstanding administration issues regarding the use of the two small scale CUEs at in Horizon Drive in Chung Hom Kok and at Yan Cheung Road in West Kowloon. We are inviting the power and telecom companies to lay their services within these two CUEs, which adopt a crossroad type of design.



*CUE at Yan Cheung Road*

## Development of the Excavation Permit Management System (XPMS)

The XPMS is a newly developed web based system to replace the existing Utility Management System and its Internet Interface. The new system improves the efficiency, transparency and user-friendliness of excavation permit processing and management. Phase I of the system, which processes Road Works Permit in the Tsing Ma Control Area and Expressway Works Permit, has been rolled out in January 2009. The system will be fully implemented when Phase II on Road Excavation Permits is rolled out in late 2009.

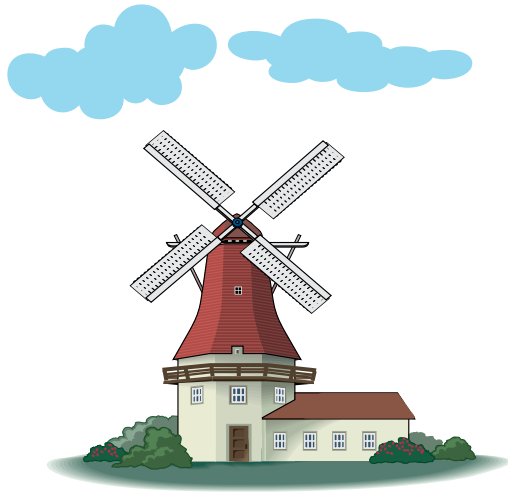




## **Clean Air Charter and Green Office Management**

We are proactive and committed to energy saving. Various energy saving measures have been adopted to support the clean-air initiatives and to sustain green office environment.





## Energy and Emission Management Team

The Energy and Emission Management (EEM) Team, set up in Highways Department in September 2007, has been providing support to the implementation of EEM programme of the department. It is responsible for the design and implementation of measures to reduce emissions and to minimize energy consumption, and for the provision of training to our staff on environmental management. The EEM Team commissioned Electrical and Mechanical Services Department (EMSD) to conduct an energy audit in 2008, covering our offices at HMTGO. Five energy management opportunities were identified:

1. Replace the remaining T8 fluorescent lamps with T5 fluorescent lamps
2. Lower the illumination level of public corridor
3. Replace existing T8 exit sign with LED sign
4. Install floor energy check meters
5. Repair broken/defective false ceiling

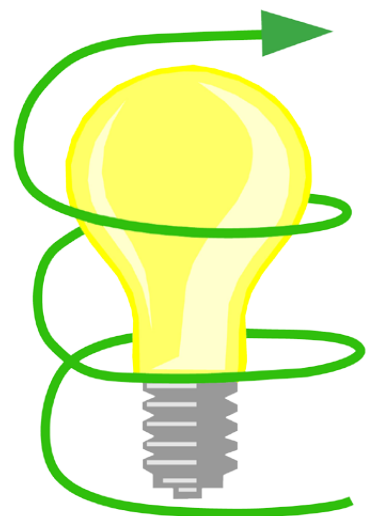
## Measures and Achievements of Energy Saving

### Energy Saving in Offices

In 2008, we had adopted the recommendations in the energy audit report mentioned above. One of them was to install floor energy check meters to monitor the electricity consumption of different floors in HMTGO. Having installed these meters in mid 2008, the electricity

consumption of our offices from UG/F to 6/F can be separately measured to facilitate our monitoring work. According to the data collected so far, the total energy consumption of our offices in HMTGO for the period of June to December 2008 was 2,586,879 kWh. The corresponding indirect gas emissions were 4,941 kg of sulphur dioxide (SO<sub>2</sub>), 3,001 kg of nitrogen oxides (NO<sub>x</sub>) and 155 kg of respirable suspended particulates (RSP).

Apart from installing floor energy check meters, we have also replaced the defective false ceilings in HMTGO to minimize the loss of air conditioning. The T8 fluorescent lamps along the public corridors will be replaced by T5 fluorescent lamps and the illumination of the public corridors will be lowered to a suitable level. Besides, the existing T8 exit signs will be replaced by LED signs to save energy. We understand that monitoring is of utmost importance in our energy saving implementation. Because of this, energy wardens have been appointed in each office and they are responsible for reminding their colleagues to comply with all green housekeeping measures in day-to-day office operations. To pave the way forward, we continue to search new and effective initiatives in office energy savings. We are now exploring the feasibility and effectiveness of installing motion detectors in cellular offices where lights will be automatically switched off once exit movement of staff is detected. Trial test will be performed shortly at the Headquarters.



## Energy Saving for Public Lighting

The public lighting electricity consumption in 2008 was 136,987,358kWh. The corresponding indirect emission was 261,646 kg of SO<sub>2</sub>, 158,905 kg of NO<sub>x</sub> and 8,219 kg of RSP. Though there was a growth in the public lighting population, we achieved a saving of 0.2% in public lighting electricity consumption in 2008 as compared with 2007.

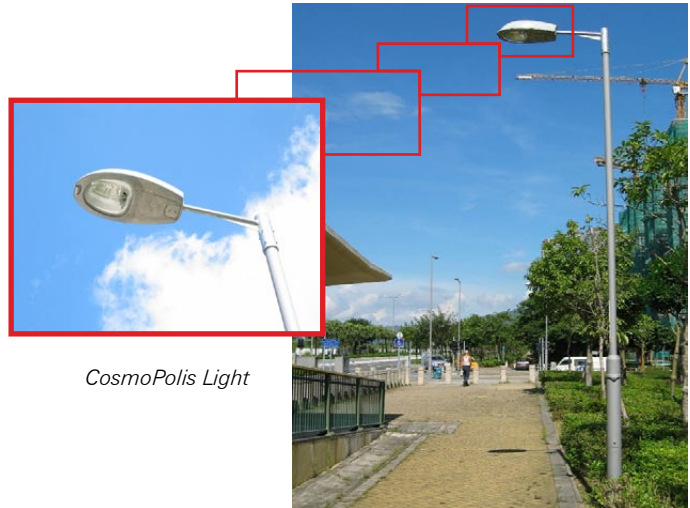
We continued implementation of energy saving measures on the public lighting system in 2008. Reduction in electricity consumption was achieved through improving the efficiency of the street lighting appliances. In 2008, 1,872 nos. of lamps and lanterns were replaced with lower wattage but higher efficiency ones, resulting in an annual saving of electricity consumption of about 304,000 kWh. We have also replaced 3,000 nos. of electromagnetic ballasts by electronic ballasts, resulting in annual saving of electricity consumption of about 287,000 kWh. In addition, we have completed our 2008 target of installing dimmable electronic ballasts at 10 nos. of footbridges, resulting in annual saving of electricity consumption of about 36,000kWh. The total annual saving of electricity consumption achieved by these three energy saving measures amounted to 627,000kWh.



*Dimmable electronic ballast*

To continue our efforts in reducing energy consumption for public lighting, we will replace electromagnetic ballasts by electronic ballasts for 3,000 nos. of public road lights and 10 nos. of footbridges in 2009.

One of our new initiatives on energy saving for public lighting is to evaluate the applicability of cosmopolis lamps for public lighting. Cosmopolis lamp is a new lamp type with better colour rendering properties and slightly better efficiency than the high pressure sodium lamp (HPS) currently used. We plan to conduct the trial schemes in 2009 to evaluate the applicability of cosmopolis lamps for public lighting.



*CosmoPolis Light*

The technology of LED lights has been developing rapidly in recent years. In order to evaluate the actual performance of LED luminaries, we appointed a university in Hong Kong to conduct laboratory tests on LED lights. Preliminary results revealed that LED lights still could not compete with HPS for general road light application due to lower luminous efficacy and reliability in outdoor conditions. Nevertheless, we will continue keeping abreast of the development of LED light technology for local public lighting application.

## Energy Saving in Works Projects

We promulgate adoption of energy saving equipment in our works projects. For instance, for the Tuen Mun Road reconstruction and improvement project, electrical appliances with energy saving labels under the Energy Efficiency Labeling Scheme will be used. Quality Powered Mechanical Equipment (QPME), which are notably quieter, environmentally friendly and efficient,



have been adopted by the contractor of our maintenance term contract 11/HY/2007. We have included requirement of using QPME in our new maintenance term contract 08/HY/2008 which commenced recently.

We have assessed the applicability of potential energy efficient systems for the Central-Wan Chai Bypass and the Island Eastern Corridor Link Projects in the Projects' Energy Efficiency Reports. We will include the specification for "Using electrical appliances with energy saving labels" in the contract tender document of these Projects.



Where applicable, we shall adopt renewable energy technologies in our new capital works projects. We shall install a solar energy system and wind energy system at the engineer's site accommodation of the Tuen Mun Road reconstruction and improvement project. We shall consider using photovoltaic technology for an irrigation system in a noise barrier retrofitting project on Fanling Highway.



## Measures and Achievements of Pollutant Emission Reduction

### Reducing the Use of Volatile Organic Compounds

For new works contracts awarded since 2008, our contractors have to use paints with low/ no volatile organic compounds (VOC). The use of such paints will help reduce pollutant emissions. We will use paints with low or no VOC for repainting the soffits of the suspended slabs inside the immersed tubes of the Cross Harbour Tunnel. We shall also encourage our maintenance term contractors to use more water-based paints for painting of concrete structures.

### Reducing the emission of gas exhaust of vehicles

The department has 37 departmental vehicles, all fueled by petrol.

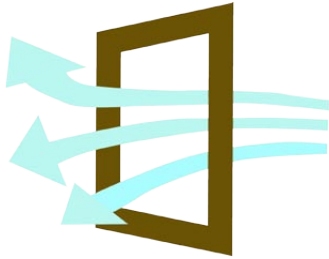
There were several measures taken to help reducing gas exhaust from our vehicle fleet. Guidelines were issued to our motor drivers, reminding them to switch off the vehicles whilst waiting so as to reduce the emission of exhausted gases and to achieve fuel saving. Our motor drivers would be updated with information concerning eco-driving from time to time.

The related emission of NO<sub>x</sub> in 2008 was 389 kg, representing a decrease of 3.95 % when compared with the emission of 405 kg of NO<sub>x</sub> in 2007. In 2009, with the replacement of 17 vehicles by environmentally friendly ones, the emission of gas exhaust from our vehicle fleet is expected to be further reduced.

Apart from government vehicles, we also encouraged our contractors to provide environmentally friendly contract vehicles for the use of our officers responsible for construction contracts. We specified in contract documents that the contract vehicles should be equipped with engines propelled by hybrid of petrol-electricity, or any other non-fossil fuels as far as practicable.

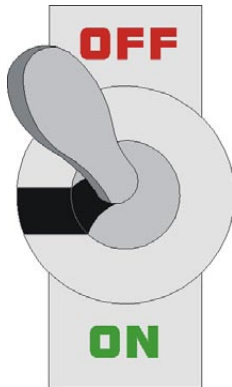
## Green Office Management

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



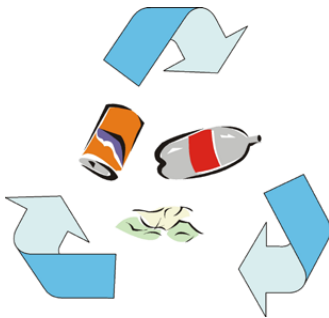
### Indoor Air Quality Certification

- The indoor air quality of HMTGO has fully complied with the Good Class of the Indoor Air Quality Objectives.



### Energy Saving

- Appoint Energy Wardens in every office/division to monitor the usage of light and to keep the lumination level to acceptable minimum level
- Review the lumination level arising from the change of room use
- Maintain air-conditioning not lower than 25.5°C
- Switch off lights during lunch or when staff are away for long hours
- Switch off computer equipment and electric appliances when not in use
- Encourage the use of staircase for inter-floor traffic
- Use timer water taps in toilets
- Monitor the electricity consumption of different floors by individual meters installed on each floor of HMTGO



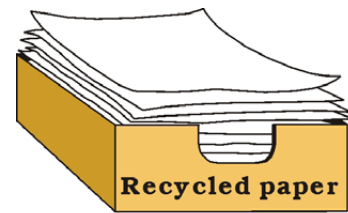
### Waste Collection for Recycling

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

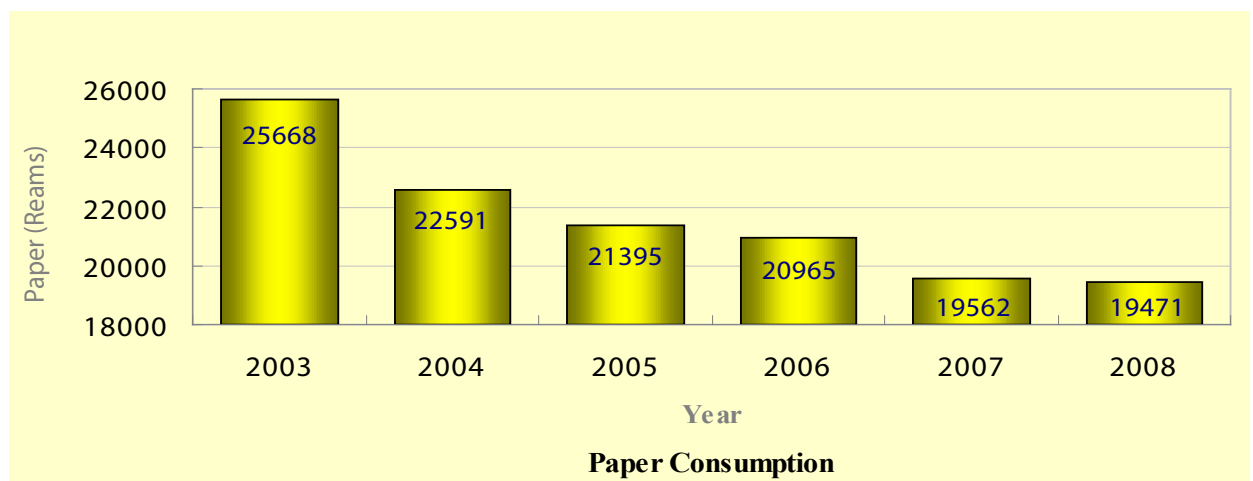


## Paper Saving

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



We continue promulgating the above measures on paper saving over the years. With the concerted efforts of our staff, we have further achieved a saving of 0.46% in paper consumption in 2008 when compared with 2007.



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

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





## **Environmental Awards**

**Respect** - *careful selection of species to suit various locations such as ecological fish ponds*

**Recognition** - *the Development Bureau recognizes our construction sites with good site safety and environmental performance*

**Reaffirmation** - *Highways Department determines to tackle new challenges and to develop the best road and rail infrastructure in Hong Kong with the same spirit of Beijing Olympics*



## The Best Landscape Award 2008 – Grand Award for Deep Bay Link

Deep Bay Link received the Grand Award of Excellence under the public projects category and a Gold Award in The Best Landscape Award 2008, which was organised by the Leisure and Cultural Services Department and co-organised by the Home Affairs Department, the Buildings Department, the Hong Kong Institute of Architects, the Hong Kong Institute of Landscape Architects, the Institute of Horticulture (Hong Kong), the Hong Kong Institute of Surveyors, the Professional Green Building Council, and the Hong Kong Association of Property Management Companies. The Best Landscape Award is organised every two years and 315 entries were received in the event.



*Planting underneath viaduct*



*Planting adjacent to rural settlement*



*Planting for slope greening*



*Planting adjacent to ecological fish pond*

Deep Bay Link is a dual 3-lane carriageway with a total length of about 5.4Km, extending from Ngau Hom Shek in the north near the shoreline to Lam Tei in the south. The majority of the Deep Bay Link is in the form of viaduct. Special planting was carried out en-route and species were carefully selected to suit various locations such as underneath viaduct, adjacent to rural settlement and ecological fish ponds, on slopes, earth mound, planting areas adjacent to noise barrier, along transport corridor and at green nodes. It is our honor that the good greening work of this project was affirmed by the jury and the public. We anticipate that our projects will keep providing quality greening and environment in associate with our road works.



*Planting adjacent to noise barrier*



*Planting to green transport corridor*



**Environmental Awards**



Planting at green node



Public Projects – Grand Award of Excellence (Soft Landscape Design Award)



Newspaper cutting from Ming Po

**Outstanding Environmental Management and Performance Grand Award (OEMPGA) and Considerate Contractors Site Awards (CCSA)**

In 2008, our construction sites were presented with one Outstanding Environmental Management and Performance Grand Award (OEMPGA) and four Considerate Contractors Site Awards (CCSA). The Award Scheme was organized by the Development Bureau to recognize construction sites with good site safety and environmental performance, and considerate attitude towards the neighbourhood and the public.



Presentation of medal for OEMPGA Silver Award – Highways Department Term Management Contract (Maintenance of High Speed Roads in New Territories West and Kowloon 2004-2008)



Display board for Highways Department Term Management Contract (Maintenance of High Speed Roads in New Territories West and Kowloon 2004-2008)



## Hong Kong Flower Show 2008 – Grand Award for Unique Feature (Landscape Display)

With the support of the management, 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 2008, “Beijing Olympics”, our design has adopted the same concept, which is “Highways for Olympics”. Vibrant blossoms weave into road and rail geometry throughout the HKSAR territory. This signifies our strong commitment to provide fast and comfortable transport network while allowing a flexible and open approach. The focus of the display is a 5m high bridge structure and carriageway scene through rural (informal) to urban (formal) settings by a flowering sea. This reflects our roads and rails networks over the territory. A directional sign in the centre of the bridge showing the way to the Hong Kong Equestrian and Beijing Olympic Events reinforces the mood of celebration. Trees and flowers are planted in planters with bench and lamp posts installed with hanging flower pots. This symbolizes our effort to enhance the streetscape. A series of display panels with our key projects newly completed, under construction and under planning stage are shown along the pathway. This demonstrates Highways Department’s determination to tackle new challenges and develop the best road and rail infrastructure in Hong Kong with the same spirit of Beijing Olympics.



*Prize Presentation*



*Flower display*



*Display shows design theme “Highways for Olympics”*



## **Achievement of Environmental Objectives and Targets and Environmental Targets for 2009**

**“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 clear objectives and targets in our environmental management plan every year, and are pleased to conclude that most of our targets for 2008 were satisfactorily met. Our achievements are summarized as follows:

Objectives	Targets set for 2008	Achievement (as at 31 Dec 2008)
Installation of electronic ballasts with a view to reducing energy consumption	To complete installation of 3,000 electronic ballasts for road lighting	3,000 electronic ballasts were replaced
Installation of dimmers at footbridges with a view to reducing energy consumption	To complete installation of dimmers at 10 footbridges	10 footbridges were installed with dimmers
Implementation of Clean Air Charter initiative	Energy and Emission Management Team to arrange an Energy Audit to examine energy consumption equipment in Ho Man Tin Government Offices (HMTGO) in early 2008 and to recommend measures in minimising energy consumption and reducing emissions	Energy audit for HMTGO was completed in April 2008 with five Energy Management Opportunities identified
Encouraging the use of recycled paper in the Department	To raise the percentage of recycled paper from 90% to 92% of the total consumption	Target was achieved
Further reduction in electricity consumption in individual floors of HMTGO where the Departmental Headquarters are located	To delamp some of the lamps of the corridors on UG/F to 6/F in early 2008	The exercise will continue until early 2009
Recycling materials	<p>To progressively introduce the use of asphalt incorporating reclaimed asphalt pavement in roadworks</p> <p>To complete the study on asphalt rubber and asphalt rubber mixtures</p>	<p>Reclaimed asphalt pavement was used in the NT West high speed road term contract and the Tuen Mun Road reconstruction contract</p> <p>The study was completed in December 2008</p>

<b>Objectives</b>	<b>Targets set for 2008</b>	<b>Achievement (as at 31 Dec 2008)</b>
Planting trees and shrubs	To plant 250,000 trees/shrubs in the vicinity of major highway projects	295,000 trees/shrubs were planted
Procuring environmentally-friendly contract vehicle	To procure at least one environmentally-friendly petrol private car model in each of the new major works contracts	Target was achieved for all 4 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	Target was achieved for all 4 new major works contracts
Dust emission reduction	To include a particular specification clause for dust suppression in all new major works contracts	Target was achieved for all 4 new major works contracts

## Environmental Targets for 2009

We always strive for continual improvement and shall continue in 2009 to maintain a sustainable environment with more energy saving, greening and housekeeping measures as well as research initiatives in the protection of environment. We will make every endeavour to achieve the targets set below.

<b>Objectives</b>	<b>Targets</b>
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
Energy saving in Ho Man Tin Government Offices (HMTGO) where Departmental Headquarters are located (setting electricity saving target based on the results of first energy audit)	To implement measures in minimising electricity consumption by: (a) delamping 100 nos. of lamps on UG/F to 6/F corridors of HMTGO (b) replacing 1,000 nos. of T8 fluorescent lamps with T5 fluorescent lamps (c) replacing 15 nos. of T8 exit signs with LED signs



Objectives	Targets
Improving indoor air quality	To continue upkeeping the indoor air quality at or above the level of "Good Class" in HMTGO
Adopting measures in water conservation	To educate staff on water conservation and to consider installing dual-flush toilets and automatic water taps in the toilets of HMTGO
Encouraging the use of recycled paper in the Department	To raise the percentage of recycled paper from 92% to 94% of the total consumption
Recycling materials	<p>To carry out a site trial on the use of concrete paving blocks incorporating recycled glass cullets on a footway and monitor its performance</p> <p>To continue introducing progressively more use of asphalt incorporating reclaimed asphalt pavement in road works</p> <p>To introduce the use of thermal patcher for minor asphalt pavement maintenance in the two new road maintenance contracts due to commence in April 2009</p>
Developing low noise road surfacing (LNRS) materials	To complete the study on the noise reduction performance of five different types of LNRS materials laid at Fanling Highway
Planting trees and shrubs	To plant 250,000 trees/shrubs in the vicinity of highway projects
Adopting site office equipment with energy saving label	To use site office equipment with energy saving labels in all new major works contracts
Procuring environmentally-friendly contract vehicle	To procure at least one environmentally-friendly petrol private car model in each of the new major works contracts
Reducing dust emission	To include a particular specification clause for dust suppression in all new major works contracts

**We hope you will find that this publication gives a good snapshot of our dedication and efforts in environmental protection. Should you have any comments or feedback on our work, please share with us your views through our homepage on the Internet (address: <http://www.hyd.gov.hk>). Thank you.**

