

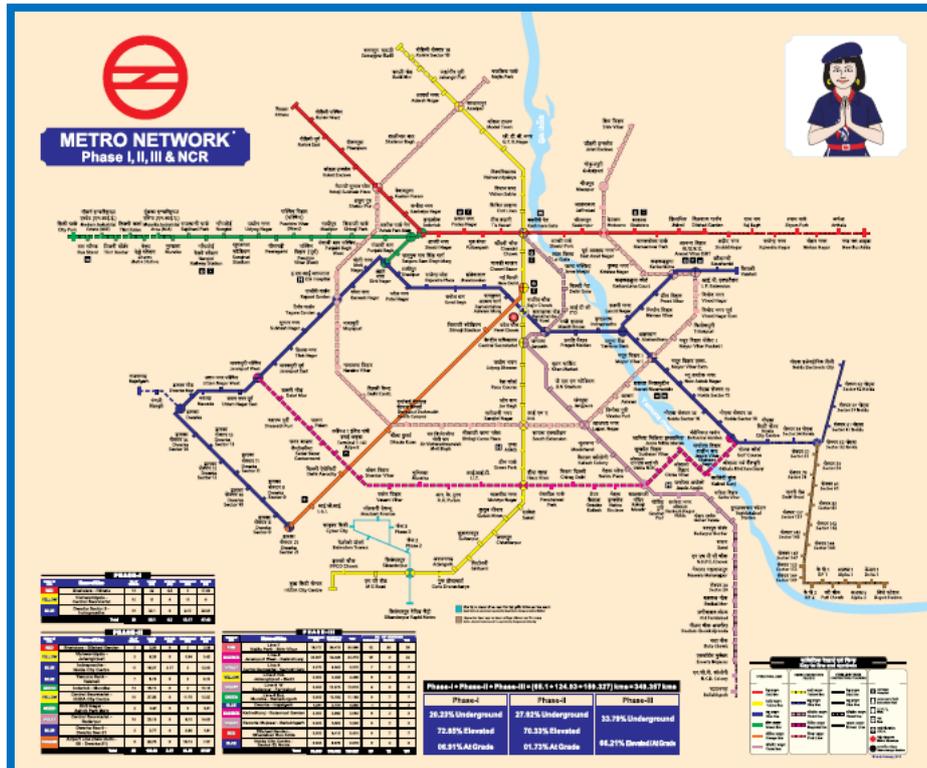
## About DMRC

The Delhi Metro Rail Corporation (DMRC) is headquartered in New Delhi, India. It was registered in the year 1995 under the Companies Act 1956 with equal equity participation from the Government of the National Capital Territory of Delhi (GNCTD) and the Central Government. The organization is implementing the construction and operation of a world-class Mass Rapid Transport System (MRTS), since its inception. As per the Master Plan of Delhi 2021, 421 km of metro network has to be constructed by the year 2021. This construction is being done in Phases. So far construction of network in two phases has been completed and 213 km operationalized. Presently construction of the third phase viz Phase-III is underway.

In the first phase of construction, which began in 1998, a network of 65 km was constructed by 2005. This increased to 125 km, in Phase-II, totalling to 190 km by 2011. The current construction phase of Phase-III, will add additional 159 KM of metro length. The network has crossed the boundaries of Delhi to reach Noida and Ghaziabad in the state of Uttar Pradesh and Gurgaon and Faridabad in the state of Haryana. DMRC today has 216 train sets of four, six and eight coaches. More than a hundred trains of six coach configuration and over 60 trains of eight coach configuration are currently operational.

Having constructed a massive network in record time, DMRC today stands out as a shining example of how a mammoth technically complex infrastructure project can be completed before time and within budgeted cost by a Government agency.

Apart from providing denizens of Delhi with a comfortable public transport option, the Delhi Metro is also contributing significantly towards controlling pollution as well as reducing vehicular congestion on the roads.



DMRC Network

## Short overview of DMRC

The way to a long term urban transport solution lies in developing a 'sustainable transport' and DMRC has demonstrated its leadership in construction and operating such a transport. This has been possible in the manner DMRC has gone about in planning, designing, implementing and operating the metro network in Delhi and the National Capital Region (NCR). For this reason, Delhi Metro has become a pride of the nation in a very short span of time. The main ingredients of this success lie in its sustainability approach which is integrated in its core values and culture. DMRC, right from its inception, has taken a number of measures for protecting the environment and conserving resources.

DMRC has two major divisions – the projects division which is responsible for construction activities and the Operation and Maintenance (O&M) division which is responsible for all operation and maintenance activities.

Innovation drives our commitment towards protection of environment in both Project & O&M. Efficient use of energy and natural resources across its construction and operations & maintenance is in the DNA of the organization. DMRC has formulated Policies on Environment Management, Energy Management, Water Management, Waste Management, Quality, QEHS and Solar Energy, which guide the multifarious activities that take place under its 'Project' and 'Operation & Maintenance' departments.

This 'Management By Objectives' approach has paid rich dividends. It has helped DMRC become carbon neutral. It has led to significant contributions in arresting climate change, successfully demonstrated through its projects under the Clean Development Mechanism (CDM) and the Gold Standard (GS), which are internationally acclaimed and are in public domain. DMRC is now fully transitioned to a 'Sustainable Built Environment' and its approximately **14 million sq ft** of structures and facilities coming up as part of Phase-III construction (which is **63%** of the MRTS under certification in the whole country) are being built to the highest "Green Standards" as mandated by IGBC. What is more, DMRC is planning to add nearly equal square footage of its existing stations also under IGBC mandated green certification.

## 1. Corporate Policy

### 1.1 Scope

- *How has your company incorporated sustainability into its policies?*
- *Is senior management on board and committed to these policies?*
- *Are employees engaged in establishing the vision and developing the policy?*
- *Are the policies sufficiently comprehensive and applicable?*

Strict adherence to our **Vision, Mission and Culture Statement** (which is annexed as **A-1**) is the hallmark of DMRC's overall Corporate Policy and approach. In accordance with this policy statement, DMRC has a clear vision to make travelling experience in Delhi Metro a commuter's delight. Our vision drives us to put the convenience and **needs of our customer** first and foremost while also making our operations, **sustainable**. In order to achieve high levels of sustainability, DMRC focuses on four main areas – **Environment Protection, Energy Conservation, Water Conservation and Waste Management**. To make these four aspects our guiding criteria in decision making process, DMRC has formulated **policies** in aforesaid key areas. These are issued by the Chief Executive of the organization i.e. the **Managing Director**, thus demonstrating organizational commitment at the highest level. Decisions are governed by the provisions laid down in these policies which are considered as the Magna Carta. A copy of each policy is enclosed herewith for reference (annexure **A-2 to A-8**). The reason why these policies could be successfully implemented is because these have been framed after much consultation and engagement with employees and staff at various levels. Their inputs and insights are invariably taken into account and once the policies are finalized, total commitment from employees, which is essential for effective implementation, becomes easily possible.

### 1.2 Implementation

- *How does the company implement and track the impact of its corporate policies?*
- *How are targets set and how does the company follow up to ensure targets are met?*

The policies are formulated and developed by the senior management after multiple levels of consultations and drawing upon previous experience in implementing earlier versions. These policies are regularly updated and revised. The senior management

ensures their implementation. Each of these policies is supported by an **Action Plan** which elaborates on each objective of the policy. It further details on modalities of implementation, assigns responsibilities and sets target and timelines. These are regularly reviewed by the Managing Director and other Directors.

DMRC follows the term “**SMART**” (Specific, Measurable, Achievable, Realistic and Timely) for setting the targets. Each aforesaid policy is driven by targets. These targets are part of overall objectives stated in the policy. To achieve the objective and targets an integrated management approach is followed. Heads of various departments, whose involvement is integral to achieving sustainability goals, are key representatives in the setup.

The vital issue of sustainability encompasses both of DMRC’s prime activities viz construction and operation and maintenance. Execution of visionary initiatives requires an enabling structure. In order to manage such issues which are organization wide, a department is set-up which is tasked to ensure fulfilment of DMRC’s sustainability objectives. This is DMRC’s **Environment Department**. It has trained manpower. There is a constant interaction of this department with other key departments on various issues. The Managing Director who takes review meetings quarterly and other Directors, who review the performance of various departments from sustainability point of view on a more frequent basis, draw heavily from the inputs provided by this department. Regular reviews provide ample opportunities for course correction wherever required. Any fresh directions that are to be implemented are also issued timely. Feedback from previous experience and immediate past are provided to Directors and Managing Director and issues are resolved keeping in view the overall DMRC Corporate Policy and approach towards sustainability.

For continual improvement, DMRC has adopted PDCA (Plan Do Check Act) approach, with the Environment Department acting as the nodal department.

### 1.3 Impact

- **What impact has been made in contributing to the sustainability of the built environment through these policies?**

An impact is an outcome when appreciable difference before and after, is achieved by adopting certain processes or strategies in an organizational setup. An impact should be measurable, verifiable and must exhibit economic and environmental benefits if it is to

be classified as sustainable. Some of the outcomes that have had a profound impact are the following:

**(i) Green Building Certification**

It is well known that '**Green Buildings**' are environmentally efficient buildings. In India, a building is certified as a Green Building by the Indian Green Building Council (IGBC). Hitherto, there was no norm available that could certify a **Mass Rapid Transit System (MRTS) to Green Standards**. There was thus an imperative need to develop a green rating system exclusively for metro type of works. In order to do so, DMRC and IGBC collaborated and came up with a **Green Certification norm for the very first time in the world, for rating a MRTS to Green Standards**. This pilot version of MRTS Rating System was launched by IGBC on **4<sup>th</sup> September 2014** at Hyderabad exclusively for enabling Green certification of Metro Systems. Now, the next version viz **Version 1** is also available which was launched on **20<sup>th</sup> May 2016** at New Delhi. This version as well as the previous one is applicable to all metros in the country.

All the upcoming Metro stations of the Delhi Metro, as part of construction of its third phase are being designed and constructed as 'green buildings' with specific provisions for the *conservation of energy as well as less CO<sub>2</sub> emission, water saving, waste management arrangements, better indoor air quality* etc. Nearly **40%** of expenditure is on account of energy consumption. This means that not only a significant chunk of revenue goes into meeting energy requirements, but also high energy consumption means higher CO<sub>2</sub> emission. Hence, a very significant impact of green stations and facility is to bring down energy consumption and cost along with concomitant CO<sub>2</sub> emission reduction. This is shown in the table below:

Metro station	Savings in energy consumptions (kWh/Annum)	CO <sub>2</sub> emission reduction (tCO <sub>2</sub> /Annum)	Savings in cost per year (Rs.)
Elevated	3,66,272	345	23,99,819
Underground	10,11,482	953	69,29,203

Apart from the Metro stations, 12 Receiving Sub Stations as well as the upcoming residential quarters of DMRC are also being designed in the same manner which will *reduce energy consumption, preserve resources and reduce carbon foot print*.

As of May 2016, **15 stations** and **2 Receiving Sub Stations (RSS)** of **Phase-III** which are already operational, have been awarded the **highest possible rating**

**(Platinum)**, by the Indian Green Building Council (IGBC). The Platinum rating has also been awarded to the DMRC residential Complex-'**Metro Enclave**' at Saket, New Delhi while the DMRC headquarter at Metro Bhawan has received '**Gold**' rating for maintaining it to green building norms.

**(ii) Use of renewable energy (Refer to Solar Policy)**

In energy-deficient India, DMRC's energy intensive operations for instance, could have been an additional burden on the overall energy availability from coal. DMRC explored alternative energy sources and divested into using solar energy in line with its Solar Energy Policy. DMRC has already installed **6.2 MWp** capacity of **roof top solar power plants**. By 2017 this will go up to **20 MWp** and by 2021 it is planned to install **50 MWp**. This would then ensure that **1/3 rd of current total energy consumption** of DMRC is met from **renewable energy**.

**(iii) Energy conservation measures (Refer to Energy Management Policy)**

DMRC recognized this important aspect early and therefore a number of measures have been taken during the planning and design stage to minimize energy consumption and mitigate negative impact on the environment. This has been achieved mainly by use of more efficient plant & equipments, by employing energy innovative architectural features in design and by use of renewable energy. Some of the measures taken during the planning, design and O&M stage include:

- a) Construction of most of the stations on a hump.
- b) Use of regenerative braking resulting in energy saving of about 30-40% of Traction Energy.
- c) Design of coaches:-
  - i. Reduction in Tare weight of coach by use of stainless steel
  - ii. Increased passenger capacity per coach
  - iii. Variable Voltage Variable Frequency drives
- d) Selection of 25 kV ac traction, which resulted in reduction in equipment sizing, lower losses in the equipment and in turn more efficient system.
- e) Selection of closed system, where the conditioned air gets re-circulated
- f) Adopting of 1% design criterion
- g) Choice of acceptable conditions inside coaches and stations areas using Relative Warmth Index.
- h) Selection of Energy Efficient VAC Equipment.
- i) No Incandescent Lamps are being used anywhere in DMRC. Instead around 18000 T-8, 80-NG tube lights with 93 Lumen/watt efficiency and CFLs have

been provided in underground stations and around 55000, T-8 tube lights with 67 lumen/watt efficiency have been provided on elevated stations. Gradually these will be replaced with LEDs.

- j) Lighting in Underground stations has 4 circuits, with each circuit having 25% Lights, making it easy to put off every 4th light.
- k) (xii) Sky lights have been provided in Underground Stations to maximize use of day light.
- l) Lifts & Escalators have been provided with Variable Voltage Variable Frequency (VVVF) control drives in Lifts & Escalators, which matches the power requirements with the actual load.
- m) Escalators have also been provided with the idling speed of 0.2 m/sec against the normal operating speed of 0.5 m/sec or 0.65 m/Sec.
- n) Phase-III lifts & escalators are provided with regenerative braking system
- o) Temperature inside trains set in accordance with ambient temperature
- p) Monitoring of driving technique
- q) Closing of car doors during testing to avoid air-conditioning leakages
- r) Providing limit switch with door opening to control lights of technical rooms.
- s) Energy saving through optimizing timing for running of AHUs as per passenger flow in station.
- t) Energy efficient rolling stock, improved driving technique & use of ATO.
- u) Automation of Pumps.
- v) Keeping the stand-by Transformers as cold stand-by instead of hot stand-by. Avoiding no load losses.
- w) Resetting of the air conditioned room temperature at 28° C instead of 25° C excluding equipment rooms.
- x) Conversion of conventional signage to LED to be initiated in June 2016.

Concerted efforts as mentioned above have helped keep a check on energy consumption, especially traction energy.

**(iv) ISO 50001 ENERGY MANAGEMENT SYSTEM (EnMS) (Refer to Energy Management Policy)**

DMRC has an Energy Management Policy in place. ISO 50001:2011, **Energy Management System (EnMS)** is a very recent ISO standard on Energy Management. It specifies requirements for establishing, implementing, maintaining and improving an Energy Management System, whose purpose is to enable an

organization to follow a systematic approach on achieving continual improvement on energy performance, including energy efficiency, energy use and consumption.

Delhi Metro has successfully acquired **ISO 50001:2011 (EnMS) accreditation** for Phase-I & II and has thus become the **first of its kind in the metro transportation sector anywhere in the world** to be so certified to ISO 50001:2011 (EnMS).

While applying this standard, DMRC have achieved a saving of **13,730 MVAH** and **5,628 MVAH** in year 2013 and 2014 respectively which translates correspondingly to annual savings of **Rs. 961 Lakhs** and **Rs. 394 Lakhs** respectively.

Buoyed with this success, Delhi Metro is now in the process of getting all the 108 stations of Phase-III which are under constructions, certified to ISO 50001:2011 standards.

**(v) Water Conservation** (Refer to Water Policy)

Considering water as a very important constituent for human and eco-system health and that its availability is becoming rarer, DMRC is very much concerned with water conservation and management in construction as well as operation & maintenance activities. DMRC has developed a **Water Policy** as well as its **Action Plan** to enhance the scope of water conservation.

Concerted efforts are being made to reduce water consumption. In a nutshell, the following actions have been being taken to conserve water-

In construction:

- a) Recharge dewatered water in underground construction
- b) Recharge pit at casting yards/ batching plants.



Recharge pit

c) RO reject water is used for wheel washing, toilets and for dust suppression.



RO Plant



Wheel washing using RO reject

d) Sedimentation tank at casting yard/ batching plant to recycle waste water.



Sedimentation tank



Road cleaning using treated water from sedimentation tank

e) At some construction sites, STP treated water is being used for construction purposes.

### In Operation & Maintenance

a) Rain water harvesting structures have been provided at stations, depots, colonies along viaduct. As on date, **464** Rain Water Harvesting (RWH) pits have been provided with total recharge capacity of **8607 cum**.



**(vi) Waste Management (Refer to Waste Management Policy)**

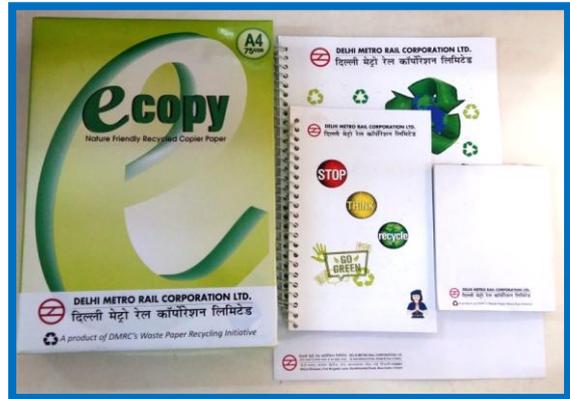
“DMRC considers today’s waste as tomorrow’s raw material”. The aim is to assess and minimize waste generation, to re-utilize/ recycle the waste and to operate in full compliance with applicable environmental laws.

DMRC has adopted following measures to identify, recycle and reuse waste:

- a) Recycling of paper waste. So far, DMRC has recycled **32 ton** of waste paper into useful office stationary. The table below shows the savings on account of recycling of this amount of paper.



**Waste Paper**



**Recycled products**

S.No.	Content	Quantity	Unit
1.	Power savings	57.6	MWh
2.	Coal consumption avoided	64	Tons
3.	CO <sub>2</sub> emission reduction	91.07	tCO <sub>2</sub> eq.
4.	Furnace oil consumption avoided	1280	Litres
5.	Water consumption avoided	8000	KLD
6.	Waste water generation avoided	224	KLD
7.	Bamboo (moisture free) saved	70.40	Tons
8.	Area of Bamboo plantation/ton saved	4.40	Hectare
9.	Chemicals such as caustic soda/salt cake, chlorine, talcum powder, alum, resin, dyes avoided	18.56	Tons

- b) As a respectable construction agency, DMRC has been ensuring recycling of Construction and Demolition waste generated from its construction activities. So far, DMRC has recycled **2.00 lakh tone** of C&D waste into useful products such as

tiles, blocks, paving blocks, kerb stones etc. DMRC is now planning to develop its own C&D waste recycling facility.



DMRC C&D waste recycling

- c) Reuse of concrete cubes which are otherwise a waste, for many purposes at site such as tree protection, making temporary pathways etc.



Reuse of waste concrete

- (d) 100% waste segregation is ensured at site.



Colour coded dust bins at construction site



Posters displayed at DMRC Colonies

- (e) Recently, DMRC established a **carpentry workshop** at one of its depot where waste wood is converted into usable products like table, chair, benches etc. So far, **124 cubic feet** of wood waste has been re-used to make benches, stool, park bench, sofa set etc.



Park benches from reused wood

#### 1.4 Tracking Impact

- **How does your company track this impact (i.e. % of work on certified green building projects, % of contribution towards a certified green building, etc) Please provide any additional information that you feel goes above and beyond other corporate policies and/or is unique to your industry**

DMRC being a government organization is answerable to a wide variety of stakeholders. It must therefore take responsibility for its action and track impact from its activities. It can track impacts either directly or indirectly. Under the former, DMRC conducts 'Customer Satisfaction Surveys' on a yearly basis. The results from these surveys are studied and improvements are made in functioning of the system. These surveys are carried out as a part of NOVA/CoMET mandate of which DMRC is a member. For the customer satisfaction surveys carried out for last two years, DMRC is ranked amongst the **first three metros** which are so rated in the customer satisfaction survey. Under the latter, it is through the robust mechanism of ISO viz ISO 14001 & ISO 50001 and through UN and Gold Standard certified CDM projects which help track the success of DMRC's sustainability approach towards urban transportation. The impact is thus both local and global. The following discussion will further provide clarity:

##### (i) Clean Development Mechanism (CDM) in DMRC

DMRC has been instrumental in **reducing its carbon foot print** and in contributing to mitigating **climate change**. Not only that, it also a forerunner in quantifying climate change benefits from its operations. In 2008, DMRC become the **first Metro**

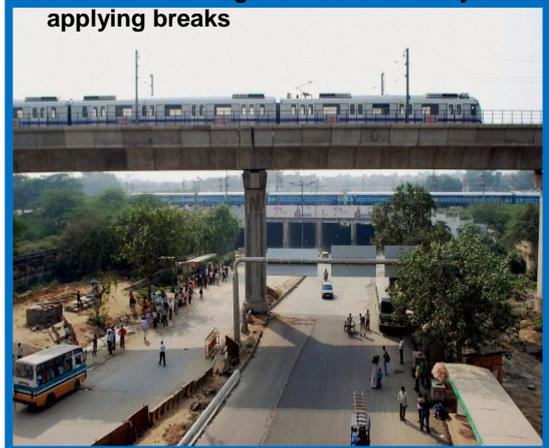
or Railway project in the world to be registered by the United Nations under the **Clean Development Mechanism (CDM)** which has enabled it to claim **carbon credits** for its Regenerative Braking Project.



**Pantograph – under operation, state on top of coach which captures the regenerated energy**



**Converter – Inverter located under the coach which regenerates electricity on applying breaks**

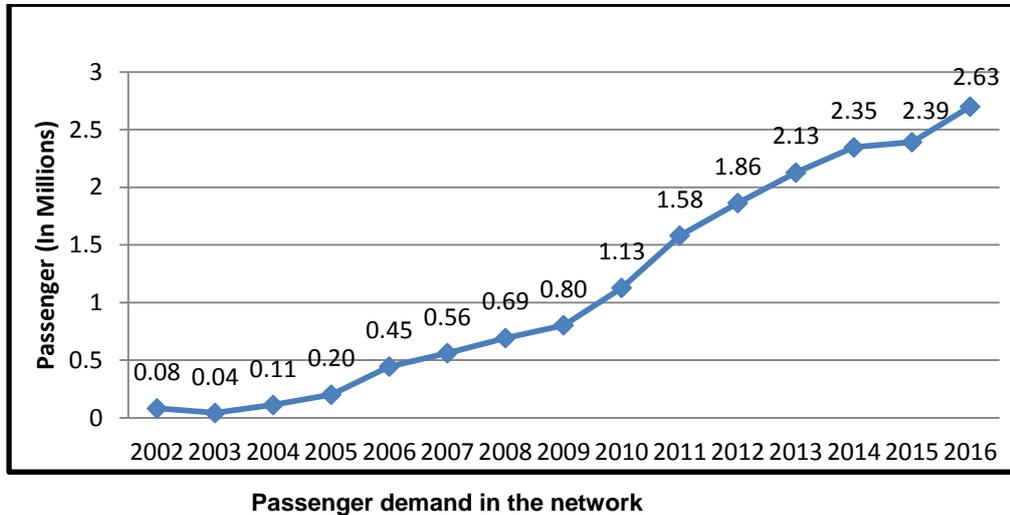


#### Effect of Delhi Metro

DMRC has so far registered three projects viz Regenerative Braking project, Modal Shift project and MRTS PoA project with UNFCCC, all of which are the first of their kind in the world, which are expected to reduce approximately **1.2 million tCO<sub>2</sub>(eq)** emission annually. The **Program of Activities (PoA) project** makes Delhi Metro the managing entity for all other metros of India for fast tracking the Clean Development Mechanism (CDM) registration of all the upcoming rail based metro systems in the country in future. These credits can be used by entities in developed nations to offset their GHG emissions. Apart from the above, Delhi Metro has also become the **first ever Metro and Railway system in the world** to be registered with the prestigious '**Gold Standard Foundation**', Switzerland, which is a globally accepted certification standard for carbon mitigation projects.

**(ii) DMRC is Carbon Neutral**

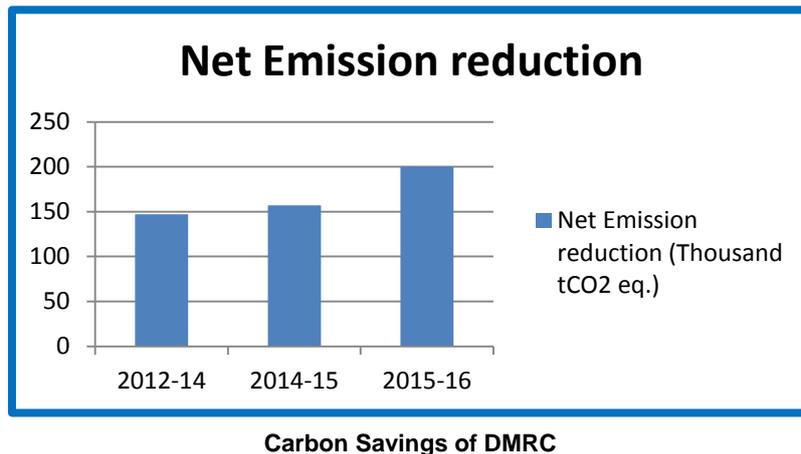
The ridership of DMRC system is growing every year. This is shown in the graph below:



This has a direct impact on emission reduction as more and more people opt for the metro as their preferred choice of travel, which translates into CO<sub>2</sub> reduction in the atmosphere. DMRC is carbon neutral, it is explained in the table below in which ridership data and CO<sub>2</sub> emission reduction have been calculated for last three years:

Year	Annual Passenger Flow (in million passengers)	Emission Offset due to Annual passenger flow (thousand tCO <sub>2</sub> e)	Emission Due to Electricity Consumption (thousand tCO <sub>2</sub> e)	Emission Due to indirect Trip (thousand tCO <sub>2</sub> e)	Emission due to DMRC Feeder Bus Operation (thousand tCO <sub>2</sub> e)	Carbon Neutral (thousand tCO <sub>2</sub> e)
		a	b	c	d	[a-(b+c+d)]
2012-13	703	774	588	76	7	103
2013-14	802	871	624	86	14	147
2014-15	871	940	676	93	14	157
2015-16	947	1011	695	100	16	200

Thus, MRTS is the most energy efficient and less carbon emitting mode of transport.



### 1.5 Verification

- **Does your company have an ISO 14001 certification?**
- **Do you have any other related environmental certifications or measurable verification tools?**
- **Please explain your company's rationale for pursuing such certification**

Verification is a very important aspect in Demming's Plan-Do-Check-Act (PDCA) cycle. Without proper verification it is difficult to find out whether or not an activity effectively served the purpose for which it was intended. For this very reason, in DMRC, the aim is to get all activities certified by an external party to various management systems to which DMRC is accredited.

ISO is one such certification, by which DMRC aims to maintain and continually improve its **Environment Management System (EMS)** in its construction as well as operational activities. **DMRC is the first metro project in the world to get certified to ISO 14001 during construction stage itself.**

What is more, DMRC has followed the integrated management approach and by doing so, all its activities in construction are certified to **ISO 14001 & OHSAS 18001**. In O&M, the activities are also certified to **ISO 9001**, in addition to ISO14001 and OHSAS 18001.

Supplementing further, its climate change activities are certified by United Nations Framework Convention on Climate Change (UNFCCC) and The Gold Standard whilst its built environment is certified/being certified by Indian Green Building Council (IGBC).

Rationale for pursuing these certifications is to meet or excel the standards where they exist, set these where they don't and on each subsequent occasion, raise the bar. This

is possible due to the high level of encouragement, competitive spirit and burning desire to excel which pervades the organization. It provides opportunity for assessment in comparison with our competitors. It helps us to understand our strength and weakness. Importantly, it provides us with a platform for recognition which then triggers the desire to achieve more.



ISO 14001 certification for Line-1 for O&M



ISO 14001 certification for Projects



**CERTIFICATE No. OHS-2362**

It is hereby certified that the Occupational Health and Safety Management System of  
**DELHI METRO RAIL CORPORATION LIMITED**  
 METRO BHAIWAN, FIRE BRIGADE LANE, BARAKHAMBHA ROAD, NEW DELHI 110001 INDIA  
 in the following operational units  
 LINE-1 COVERING 21 STATION FROM DILSHAD GARDEN TO RITHALA & SHASTRI PARK DEPOT NEW DELHI - 110 001 INDIA  
 is in compliance with the standard  
**BS OHSAS 18001:2007**  
 for the following activities  
 EA.28  
 EA.31  
 OPERATION AND MAINTENANCE OF DELHI METRO LINE 1 COVERING 21 STATIONS, FROM DILSHAD GARDEN TO RITHALA AND SHASTRI PARK DEPOT.

The validity of this certificate is dependent on an annual (or monthly) audit and on a complete review, every three years, of the management system. The use and validity of this certificate are subject to compliance with the RINA document Rules for the Certification of Occupational Health and Safety Management Systems.

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OHSAS 18001 certification for Line-1 for O&M



**CERTIFICATE No. OHS-2605**

It is hereby certified that the Occupational Health and Safety Management System of  
**DELHI METRO RAIL CORPORATION LIMITED**  
 METRO BHAWAN, FIRE BRIGADE LANE, BARAKHAMBHA ROAD, NEW DELHI NEW DELHI 110001 INDIA  
 in the following operational units  
 CPM 8, 8 JANTAR MANTAR ROAD, NEW DELHI - 110001 INDIA  
 is in compliance with the standard  
**BS OHSAS 18001:2007**  
 for the following activities  
 EA.28  
 CIVIL CONSTRUCTION OF METRO CORRIDOR BETWEEN RAISINA ROAD (FROM CHAINAGE 80.00) TO SHAMNATH MARG (TO CHAINAGE 9291.864) COVERING 7 STATIONS ON LINE-6 EXTENSION.

The validity of this certificate is dependent on an annual (or monthly) audit and on a complete review, every three years, of the management system. The use and validity of this certificate are subject to compliance with the RINA document Rules for the Certification of Occupational Health and Safety Management Systems.

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OHSAS 18001 certification for Projects

## **2. Goals & Planning**

### **2.1 Goals**

- **What are your company's short and long-term corporate sustainability goals?**
- **What measures are developed in the corporate strategy and planning to achieve these goals?**

Rather than focusing on commercial aspects alone, DMRC's raison-de-etre for incorporating sustainability is to improve processes in its Projects and O&M divisions, pursue growth, and add value and credibility to the organization. In order to achieve this, DMRC has short and long-term goals which may be summed up as follows:

#### **Short-term goals**

- Adopt best available practices in every maintenance activity to improve quality of service.
- Timely delivery of services to achieve commuter satisfaction.
- Prevention of pollution, injury and ill health by adopting suitable policies, processes and procedures.
- Consideration of energy efficient, environment friendly, health and safety issues in operation and maintenance.
- Compliance with all applicable Environment, Health and Safety (EHS) legislations and other requirements to which we subscribe.
- Ensure motivation, involvement and participation of all stakeholders to our QEHS Management System through training, awareness and continuous competence building.
- Continual Improvement in quality, environment, health and safety targets.

#### **Long-Term Goals**

- Be the first choice for commuters of Delhi and its suburbs
- Be a global leader in urban transportation
- Remain carbon neutral
- Use cutting edge technology

Some of the actions plans which are being planned to be operationalised are listed below:

- Declare metro stations plastic free zone
- Utilization of recycled materials to minimize natural resource utilization
- Use of STP treated water/ dewatered water for construction and operation activities.
- Maximum utilization of waste material generated in both construction & operation
- Invest in new technologies to minimise consumption of natural resources
- Increase the use of renewable energy up to 50% in the overall energy consumption in O&M

## 2.2 Planning

- **How is sustainability embedded in your company's strategy and business plan?**
- **How are the targets set and how does your company follow up to ensure targets are met?**
- **How is the corporate sustainability policy reassessed and improved?**
- **How often does this take place? Who is involved in its redevelopment?**

Success of an organization is often adjudged not only by its financial sustainability, but also its credibility amongst its stakeholders. Credibility is built by doing what is committed, which results in social acceptability. Environmental awareness displayed by the organization enhances its environmental credibility. DMRC believes that social and environmental credibility will follow **environmental good governance** in all its activities.

Right from its inception, DMRC has taken a number of measures for protecting the environment and conserving the resources to ensure that DMRC's construction and operations remain environment friendly and most energy efficient.

In order to achieve these goals, DMRC has put in place an effective monitoring mechanism to ensure the implementation of company's policies. Our policies on Environment, Waste, Water, Energy, Quality, and Solar inform various activities that take place under its project and operation & maintenance divisions.

Identifying the need to sensitize and gear up the work force right from the grass root level, all the policies are displayed at prominent places in DMRC premises. The aim is to disseminate the objective of these policies at various hierarchical levels and secure their active involvement in effective implementation of these policies.

**A detailed Action Plan is prepared for each of the policies.** Action plan is supported with target dates and concerned departments are made responsible to accomplish the assigned task. This Action Plan is later used in review meetings at regular intervals, as a tool to measure the progress and achievements.

DMRC dedicates “A Day” every year for each of its policies and a document- “A Way Forward”, towards implementing each of these policies is brought out on that day every year. For example, on World Water Day, a booklet viz. A Way Forward on Water Policy is launched. Similarly on World Environment day, a booklet on Environment Policy - A Way Forward is released. On this day, the achievements and challenges faced in implementing the policy for which the day is dedicated are reviewed. Based on the comments received from the executing departments and considering the vision, mission and culture of the organization, if the management feels necessary, the policy is revised. It is seen that the policy gets revised once in 2 to 3 years. The process of reassessment and its implementation is the same as is done at the first and subsequent instances.



**World Water Day 2016 Celebration - Launch of revised Water Policy and booklet on Water Policy – A Way Forward**



**World Environment Day 2016 Celebration – Launch of booklet on Environment Policy - A Way forward**

### 3. Operation Policy

#### 3.1 Scope

- What kind of inward facing (operations) sustainability policies does the company have in place (i.e. green offices, green procurement, green cleaning, staff wellness, employee engagement, etc.)

As already discussed earlier, DMRC has developed a number of policies and these are implemented them vigorously. All our decisions with respect to construction and operation are governed by the provisions laid down in these policies. The policies are formulated and developed by the senior management after wide consultations at various levels. Each of these policies is supported by an action plan which elaborates on each objective of the policy.

DMRC is implementing a number of measures in its construction as well as operation & maintenance activities to measure up to the Policies.

All the 108 upcoming Metro stations as part of third phase, are designed and being constructed as 'green buildings' with specific provisions for the conservation of energy as well as better CO<sub>2</sub> saving, water saving and waste management arrangements. Apart from the Metro stations, 12 Receiving Sub Stations (RSS) as well as the upcoming residential quarters of DMRC are also being designed with same objectives.

Of the total 108 stations, 15 stations and 2 Receiving Sub Station (RSS) of Phase-III are already operational and have been awarded the highest possible rating (Platinum), by the Indian Green Building Council (IGBC). The Platinum rating has also been awarded to the DMRC residential Complex Metro Enclave at Saket while the DMRC headquarter at Metro Bhawan has received 'Gold' rating for maintaining it to green building norms.



Platinum Rating being awarded to operational stations in May 2016



Gold Plaque for Metro Bhawan awarded in May 2016

Environmental sanitation activities could result in release of toxic chemicals into the atmosphere, if not chosen with care. DMRC prefers procurement of green products which exhibit any of following characteristics: environmentally preferable, energy efficient, less CO<sub>2</sub> emitting, bio-based and made with recycle content products.

DMRC’s green procurement Policy applies to all cleaning material purchases and cleaning equipment purchases. The goal of this policy is to ensure that the purchase of cleaning products and materials meet applicable sustainability criteria.

DMRC not only ensures its structures and equipments to be environment friendly, it also undertakes Clean & Green drive to ensure all the cleaning activities of DMRC is carried out in environment friendly manner. Only eco-friendly chemicals are used in DMRC for cleaning trains, stations, building etc and at selected locations Effluent Treatment plant (ETP)/ Sewage Treatment Plant (STP) treated water is being used for this purpose.



Effluent Treatment Plant



Sewage Treatment Plant

DMRC is using **fly ash** in concrete production and bricks which resulted in reduction of cement consumption and CO<sub>2</sub> emissions. Construction and Demolition waste generated during construction is either recycled at IL&FS, Burari or reused for internal development.

**Fly ash consumption details**

Year	2012-13	2013-14	2014-15	2015-16
Quantity (MT)	2,207	1,02,293	72,305	3,89,983



#### Use of Fly ash bricks

All the equipments, machineries used in DMRC are based on latest technologies and are most energy efficient. Rolling stocks and lifts & escalators of DMRC are equipped with regenerative braking system by which, on an average **35%** of electricity is regenerated and is reused this reduces overall consumption from the grid. Low water consuming fixtures like dual-flush, low flow taps etc. are also being installed at metro stations, offices and residential colonies.

Low VOC paints, adhesives and sealants are being used in the buildings to reduce the adverse health effect and improve quality of indoor air.

DMRC ensures all the paper waste generated within its premises is recycled. DMRC has adopted Barter Model in which vendor takes away waste paper from all DMRC complexes and provide stationary items viz. Spiral Notepad of A4 & A5 size, A4 size paper rims, etc. of recycled paper quality.

DMRC has also signed a '**Wash Pledge**' with The World Business Council for Sustainable Development (WBCSD), in which DMRC has committed to provide safe and hygienic work place for its staff. Though the pledge does not require any mandatory verification, DMRC being a government organization, is open to public scrutiny. It has taken various steps to fulfil its requirements on the pledge.

Feeder buses are operated by DMRC to provide first and last mile connectivity. These are run in today's cleanliest burning fossil fuel 'CNG' which produces significantly less pollutants than gasoline.



Feeder Bus

DMRC is an employee centric organisation. It considers 'staff wellness' as one of its top priorities. For this reason, great emphasis is laid in **ergonomics, comfortability, indoor air quality** and **high hygiene standards** at work place and wash rooms. Depots and the Head Office viz. Metro Bhawan are equipped with gymnasiums. Regular Yoga classes are held for employees of all categories.

DMRC is committed to building a work culture that nurtures and grooms the progressive workforce through its abiding commitment to employee's engagement. All employees operate in a work environment which has been recognized for the quality of its safety and health standards. Employee engagement with positive work environment is one of the primary motives of HR policies of DMRC. It endeavours to provide best benefits to employees to provide them social and financial security. Some of the benefits offered to employees in general are life insurance, health care, Disability and invalidity coverage. Retirement provision, Staff Quarters Group superannuation scheme Housing/ Vehicle/ Multi Purpose/Festival/ laptop Advances etc. As enshrined in the value system of DMRC, the organization believes in continual investment in talent development of the employees. This is essential to increasing the overall engagement and productivity at large, which in turn, drives the company's culture. DMRC has its own **Training Institute** which acts as the forum for capacity building.

### 3.2 Implementation

- **How are the sustainability targets set?**
- **What measures to ensure that these targets are met?**

DMRC established various policies to address all of its activities related to Projects and O&M. All these policies are target specific. An Action Plan is prepared for each of the

company's policies which elaborate on each objective of the policy. Action plan is supported with target dates and departments concerned are given responsibility to accomplish the assigned task. Apart from these policies, DMRC believes in information sharing. Employees are encouraged to participate in various national and international seminars and conferences.

During the review meetings, based on the feed track provided on performance and challenges faced to achieve the objectives, necessary amendments are adopted to the Action Plan, if needed.

DMRC has a separate Environment Department. It has trained manpower. It acts as the eyes and ears of Directors on sustainability issues. There is a constant follow up and feedback on various policies, for example the Managing Director takes quarterly review making meetings while Directors review the performance of various departments from sustainability point of view on a much more frequent basis. This provides ample opportunities for course correction if required. Any fresh directions that are to be followed at site or any other location are also intimated timely. Feedback from previous experience is provided to Directors and Managing Director and issues are resolved keeping in view the overall DMRC corporate policy and its approach towards sustainability.

### 3.3 Tracking Impact

- **How does the company track the impact of these operation policies?**
- **Are staff involved in tracking their operations behavior and reviewing how this impacts the operation policies?**

While this aspect has been dealt with in great detail earlier, suffice would it be to say that **tracking the impact** of our activities is inbuilt in DMRC. Impact of policy is employee eccentric. There are various mechanisms to keep employee motivated and engaged for implementation of best operating practices. The employees are informed of latest developments, imparted trainings regularly and are constantly supervised to ensure their behaviour and output are in sync with operational policies.

## 4. Industry Leadership

### 4.1 Leadership

- **How is your company a leader in the industry?**
- **What kind of policies and practices allow your company to go above and beyond industry best practice? What impact have you brought to the green building industry?**

It is rightly said that **“Winners do not do different things. They do things differently”**. DMRC has demonstrated this time and again.

Delhi Metro has transformed the travel style of the people of Delhi infusing a new social attitude and awareness. Our clean stations, gleaming trains and orderly flow of commuters have made Delhi Metro the preferred choice of Delhi commuters. The success of the Delhi Metro has today led to a Metro revolution in India.

What can be said emphatically about DMRC’s leadership role is that it has brought about a sea change in the manner in which large infrastructure projects are executed. DMRC is a demonstrated leader in exhibiting adherence to time and budgetary allocation and a unique work culture which puts great emphasis on discipline, integrity and ‘we mean business approach’ attitude.

Phase-1 of Delhi Metro, consisting of 65 km both elevated and underground, was completed 2.5 years ahead of schedule without any cost overrun. Similarly, Phase-2 of Delhi Metro, consisting of 125 km was completed on time and within budgeted cost. For Phase-3 also, DMRC is aiming to repeat this feat.

DMRC is the first organisation in India to carry out large scale underground construction work in an urban setup without causing inconvenience to public. For this, DMRC was the first organisation to setup safety and environment codes of practice in construction which have become a trend in the country. The technical specifications developed by DMRC are being followed by other metros as well as other organisations across the nation.

DMRC has evolved as an experienced organization in planning, design, development, construction and operations of metro projects. DMRC **provides consultancy services** for almost **all metro rail projects being undertaken in India**. The consultancy works

includes preparation of Detailed Project Report (DPR), providing interim consultancy till general consultants are in place and undertaking the construction of metros on Engineering Procurement and Construction (EPC) basis. DMRC has been entrusted with the construction of Metro in Kochi and Noida - Greater Noida, as deposit work, by the respective State Governments of Kerala and Uttar Pradesh. DMRC has already completed the construction of Jaipur Metro Phase-1A with a 9.25 km corridor on deposit terms. DMRC is also the Interim Consultant to Lucknow Metro and Ahmadabad Metro.

DMRC has itself achieved the highest operational length in India by operating a vast network of 213 km with another 160 km in construction which will be operational by end of 2016. DMRC caters to an average ridership of **27 lakhs** daily resulting into de-congestion of traffic in the highly populated city like Delhi/NCR.

DMRC participated at COP-21 event held at Paris as part of Government of India entourage to show case itself as a Leader in Green and Clean MRTS in India.

#### 4.2 Advocacy

- **Is your company an active advocate of green building policy/ regulation/ standards to government through a GBC policy task force or other organization?**
- **Is your company an active advocate in the community for green initiatives or corporate social responsibility?**
- **Have you actively involved in GBC policy taskforce?**
- **Is your company an active advocate of corporate social responsibility?**

DMRC is an active advocate of green building policy and standards. DMRC follows the rating system developed by IGBC and some of our already operational stations of Phase-III have been accredited to “Platinum-Highest Level of Rating”. DMRC is a **founding member of Indian Green Building Council**. DMRC has made significant technical contribution to the Draft National Building Code being brought out by the Ministry of Consumer Affairs, Food & Public Distribution, Government of India.

So far as advocacy in the community and green initiatives is concerned, DMRC believes in leading by example, it follows the adage “***Walk the talk***”. A few examples mentioned below will illustrate clearly the fact that DMRC has been a strong votary of green initiatives.

Conservation of environment is one of Delhi Metro's top priority areas. In both its Operations and Construction activities, the Delhi Metro team is constantly working towards adopting technologies and work methods that care for the environment.

- 1) The UN Framework Convention on Climate Change (UNFCCC) has registered Delhi Metro in two categories for promoting 'Clean Development Mechanism (CDM) and earn carbon credits: **Regenerative Braking** and **Modal Shift**'. The Delhi Metro has also been certified by the United Nations (UN) as the first Metro Rail system in the world to get carbon Credits for reducing Green House Gas Emissions as it has helped reduce pollution levels in the national capital by 6,30,000 tons every year thus helping in reducing global warming.
- 2) Delhi Metro is the first ever Metro and Railway system in the world to be registered with the prestigious **Gold Standard foundation**, which is a globally accepted certification standard for carbon mitigation projects.
- 3) All the stations of Delhi Metro under its third phase of expansion are being designed as '**GreenBuildings**'. 15 new stations of the Delhi Metro, constructed as part of the third phase of Metro's expansion have already received the highest 'platinum' rating from the Indian Green Building Council (IGBC), which has developed green standards for accreditation of Metro stations as green buildings.
- 4) According to a study conducted by the prestigious Central Road Research Institute (CRRRI) New Delhi, Delhi Metro has so far helped in reducing the consumption of **vehicular fuel** up to **276 thousand tons annually** as many motorists have shifted to the Metro for their commuting requirements leaving their personal vehicles.
- 5) Delhi Metro operates **464 rain water harvesting pits** with a capacity of **8,607 cum**. It has also opened Sewage Treatment Plants (STP) and Effluent Treatment Plants (ETP) at its depots and residential colonies.
- 6) DMRC has also recycled **32 tons of waste paper** generated in its offices in a short span of time.
- 7) Delhi Metro has taken a host of other recycling initiatives under which many other waste materials generated by Delhi Metro such as horticultural waste, wooden materials, steel sheets etc are being reused after recycling.

8) While carrying out its construction work also, Delhi Metro is always concerned about the preservation of the environment. For every tree cut during construction work, 10 trees are planted. DMRC also transplants trees to alternate locations wherever possible without causing any damage to the trees. The transplantation is done scientifically by experts and the survival rate is almost cent percent.

DMRC has actively participated in the GBC Policy Workforce through formulation of IGBC MRTS Rating System for existing and new metro stations. DMRC is also a **FOUNDING MEMBER OF IGBC**.

The Delhi Metro, being a public service system, has a very close connect with the masses. Therefore, **Corporate Social Responsibility (CSR)** is something that comes naturally to us. Since 1998 when DMRC started its journey, CSR activities have formed an integral part of our work culture. As part of its CSR activities, DMRC has constructed a **children's home** near Tis Hazari metro station. The home has five dormitories, two classrooms, a playground and an amphitheatre. It has also been provided with some other basic requirements like a library, a mess etc. About 100 to 125 children can be accommodated in this home. DMRC has provided all the furniture required for the children such as beds, almirahs, tables, chairs, televisions and other items. An organization known as the '**Salaam Balak Trust**' manages this children's home. During the winters, DMRC also opens '**winter home**' for the senior citizens at a few locations in the city. The facility, opened in association with the NGO-'Help Age' India in 2011, serves dinner, breakfast and tea to about 40-45 occupants and basic medical assistance is also provided to them during the winter months. This 'winter home' is of great benefit during the extreme winter months of December, January and February. Along with accommodation, food and basic medical help, physiotherapy and health check up sessions are also organised. Under the aegis of the Metro Museum, various CSR activities such as workshops, visits are organized for children undergoing treatment for cancer, physical disabilities etc. Special Metro rides are also arranged for senior citizens and children from the disadvantaged sections of the society.

*As per the Companies Act 2013, all companies which have a net profit of Rs. 5 crores and above are obliged to contribute 2 % of their net profit towards CSR activities. But DMRC is not a profit making enterprise and therefore is not obliged to contribute any funds towards CSR activity. However even though the law does not warrant so, DMRC has been carrying out CSR activities in fulfilling its Corporate Social Responsibilities as illustrated earlier.*

### 4.3 Scale

- **Does your company's portfolio (product or service) reflect your commitment to sustainability?**
- **How much of your business is considered sustainable according to the definition your company sets out in its policies?**

DMRC's main product or service is to provide safe, reliable and comfortable means of mass transport for denizens of Delhi and NCR. Alongside is DMRC's commitment for operating and maintaining a sustainable transport. The operations of metro are environment friendly, they reduce air and noise pollution, bring down number of accidents and help in the overall preservation and enhancement of environment, locally and globally. These may be classified as **co-benefits** of modern day mass Rail based Mass Transit Systems.

In order to capture the three dimensions of Sustainability viz. Economic, Social and Environmental, in train operations, a reputed research organization viz Central Road and Research Institute (CRRRI) New Delhi, conducted a study on the many **benefits** that may have accrued since the Delhi Metro started its operations in Delhi and its suburbs.

As per the study, ridership in Delhi metro has taken a large number of vehicles off the road. DMRC has also contributed towards the reduction in Air pollution, GHG Emissions, fuel savings, reduction in travel time, reduction in accident. The following table gives these co-benefits of Delhi Metro in various years of operation based on the ridership of that year.

Descriptors	2011	2014	2015
No. of vehicles off the road daily	1,17,249	3,90,971	4,19,937
Annual reduction in fuel consumption (t)	1,06,493	2,76,000	2,99,000
Annual reduction in pollutants (t)	1,79,613	5,77,148	6,19,907
Savings in time per trip (minutes)	28	31.76	31.97
Annual reduction in fatal accidents (No.)	111	125	135
Annual reduction in all accidents (No.)	591	937	1013

The above benefits were monetised and economic cost of the benefits is summarised below:

Descriptors	2011	2014	2015
Annual Time Cost Saved by Metro Passengers in Cr. Rs. (Million USD)	5,161 (774)	4,107 (616)	4,601 (690)
Annual Fuel Cost Saved by Metro Passengers in Cr. Rs. (Million USD)	966 (145)	2,372 (356)	2,564 (385)
Annual Vehicle Operating Cost Saved by Metro Passengers in Cr. Rs. (Million USD)	1,414 (212)	2,617 (393)	2,951 (443)
Emission Saving Cost in Cr. Rs. (Million USD)	173 (26)	489 (73)	561 (84)
Accident Cost in Cr. Rs. (Million USD)	55 (8)	63 (9)	72 (11)
Annual Time Cost Saved by Road Passengers in Cr. Rs. (Million USD)	1,742 (261)	461 (69)	532 (80)
Annual Fuel Cost Saved by Road Passengers in Cr. Rs. (Million USD)		31 (5)	35 (5)
Annual Infra Structure Maintenance Cost in Cr. Rs. (Million USD)	742 (111)	625 (94)	678 (102)
Total Cost of All Benefits (Cost without discount) at current price in Cr. Rs. (Million USD)	10,254 (1538)	10,764 (1614)	11,995 (2999)

## 5. Knowledge sharing/transfer

### 5.1 Education

- How does your company work to showcase its best practices and promote sustainability in the sector? (i.e. knowledge sharing/education seminars, publications, senior management presentations etc)
- How does the company educate employees, community, and the industry about best practice?

DMRC regularly organizes events inviting participation from other metros in India and from overseas, in which the best practices and cutting edge technology being followed by DMRC is shared with participants.

DMRC participates in national and international events specially related to environment, sustainability and green buildings where it shares experiences and showcases its achievements. Such events offer a great learning opportunity and help to raise the bar.

DMRC has made documentary film of various durations that highlight DMRC's leadership role in sustainability, which are telecast in both national as well as international venues like COP-21 Paris.

DMRC is the recipient of **Environmental Leadership Award** by US Government in 2004 and the **Golden Peacock Award** by Institute of Directors in 2005. In the year 2009, DMRC was awarded the "**Best Environment Friendly Project**" by Prime Minister of India. In 2015, present Prime Minister referred DMRC in very appreciative terms and commended its achievements in protecting the environment and in use of solar energy while inaugurating DMRC's Badarpur - Faridabad corridor.

In order to meet the objectives of educating/training employees and encouraging initiation and ownership of environmental activities, a strategy with emphasis on "Inform-Train –Supervise" has been formulated.



DMRC Training Institute

## 5.2 Training

- **Have you committed to education of your work-force through local GBC education courses or other regional green skills programs?**

DMRC has its own training institute which acts as a well informed forum for capacity building. The training institute imparts not only knowledge but also the skills through various modes like simulators, attitude and soft skills training etc. Fresh recruits who are selected through recruitment process are given initial training so as to prepare them for their job profiles. Time to time refresher training is also imparted to existing employees to enhance their knowledge which keeps them abreast with latest updates in the technology, systems or processes. Training on shouldering higher responsibilities during promotion and reshuffling is also provided.

DMRC develops the staff capabilities and competence of not only DMRC employees but also employees from other metros systems.

DMRC environmental team has been conducting a range of environmental education and awareness-raising activities for employees in order to raise the standard of the organization's environmental conservation activities.

### (a) Induction Training

Training School at Shastri Park provides employees with continual education matched to their position, group and department, based on the educational training plan for the employees. For example, it conducts introductory training and a basic workshop program for all new employees. In addition to other technical subjects, these training sessions also cover the latest information on DMRC's environmental initiatives and other environmental issues considered to be important in recent

years. The new employees are also taught about the activities we are undertaking to reduce various negative environmental impacts from our activities.

**(b) Training Internal Auditors**

DMRC is an ISO 14001 EMS certified organization. In order to maintain and improve environmental management systems, it is critical to maintain and improve the quality of internal audits. The environmental department of DMRC therefore provides employees with an internal auditor training course and an internal auditor skill-up training course twice a year. From the perspective of strengthening compliance, the environmental department also conducts effective training sessions on relevant environment-related laws and regulations.

**(c) Management Development Programme**

Further, at the request of other organizations, the training school also holds training seminars under the Management Development Programme. Senior executives belonging to various metros and other organizations from both India and abroad, participate. At these courses and seminars, lectures are given by expert faculty which provides support for the establishment of environmental management systems to participating organizations. DMRC's environmental initiatives and success in this field are shared in these lectures.

**(d) Training DMRC's and Contractor's Engineers**

A number of measures have been taken to create and sustain environmental awareness amongst DMRC and Contractors' staff. Power Point Presentations on Environmental awareness are being given to DMRC's employees from time to time. 96 hours of training program is being conducted at construction site where awareness on environmental issues is imparted. DMRC employees are also made aware of environment policy, energy management policy, sustainability and motion policy and waste management policy. Action plan for energy management policy and water policy have been issued and are being followed up. For water and waste management policy the action plan is under preparation. Once issued, a data bank shall be developed to monitor this data and take proactively, remedial measures that may be required.

**5.3 Legacy**

- **How does the company engage students or recent graduates (i.e. internships, thesis/dissertation sponsorship, and involvement with academic institutions)?**

Every year students from all across the country belonging to various engineering disciplines undergo internship/summer and winter training at DMRC's construction sites and O&M facilities. Such trainings which are very popular amongst the students help them to understand the final nuances of their discipline as applied to actual situation. The trainings are undertaken in batches which commence invariably with DMRC's Human Resource (HR) Department organizing a site visit and providing induction training. Thereafter, the students based on their core discipline are sent to various departments of DMRC where they will undergo extensive hands on training to understand various engineering and managerial aspects of not only their own discipline but the project and organization as a whole. After completion of the training, each candidate is required to submit a project report.

The academic world at large finds in DMRC's works, variety and range. On its part, DMRC encourages free flow of ideas and freedom of action. For this reason perhaps, many students have availed the opportunity to take up their master or doctoral dissertation work under the guidance of senior level staff. As an example, students from one of the science colleges under Delhi University are undertaking a project to harness wind energy from train movement inside the tunnels, to generate electricity.

DMRC shares a two way relationship with some of the premier institution in the country. While many institutions have approached DMRC to do case study on the **success story** of DMRC the others have been engaged by DMRC to provide managerial training to its officers and staff from time to time. Technical institutes are approached for their inputs to resolve issues that may arise. In turn these technical institutes look upon DMRC as a vast reservoir of technical data and information available under one roof for a happening project, which is a rarity.

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