

# **Hubli-Dharwad BRTS Company Limited**

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## **Draft Action Plan for Green BRTS Programme**

August, 2013 (V 2)

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# 1. Introduction

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The Government of Karnataka has taken up the implementation of a Bus Rapid Transit System (BRTS) between twin cities of Hubli and Dharwad. The project includes development of transit infrastructure, improvement of pedestrian network, development of BRTS corridor and other related works. This project is expected to improve and promote environmentally sustainable transport infrastructure and services in the twin cities.

Hubli – Dharwad BRTS Company is a Government of Karnataka undertaking entrusted with the implementation of BRTS in Hubli and Dharwad. The Company has conducted an extensive environmental impact assessment for identifying environment effects, if any, due to the project and has also prepared Environment Management Plan (EMP) for mitigation of the impacts.

In the EMP, the Hubli – Dharwad BRTS Company has undertaken to implement the necessary mitigation measures. It is the intention of the Hubli – Dharwad BRTS Company to ensure a green BRTS project. Therefore, the company has decided to go beyond the required mitigation measures listed out in the Environment Management Plan and take up other measures for greening of BRTS corridor, public spaces in Hubli and Dharwad and development of green spaces in and around transit infrastructure. This action plan establishes a framework for measures that are contemplated by the Hubli – Dharwad BRTS Company Ltd.

## **2. Vision**

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*"The landscaping along the transit corridor and facilities will be distinctive, appealing and functional, and would evoke a sense of ownership and pride amongst the community apart from enriching the overall experience of transit."*

This vision will be achieved through careful planning and implementation that focuses on innovation, adoption of best practices from around the world while showcasing the local natural biodiversity.

### **Aims and Principles**

- Proactively take up compensatory plantation to mitigate environmental impacts caused by the project if any as per the provisions of the Environmental Impact Assessment and Environmental Management Plan.
- Provide attractive and functional landscapes i.e. verges and medians along the BRTS corridor and the right of way.
- Ensure development of green oasis in and around transit infrastructure which could perform the function of an engaging public space.
- Plant 5000 trees in the open area near Sanjeevini Park and other public spaces which shall showcase the bio-diversity of the region.
- Ensure community awareness and engagement occurs during planning and implementation process.

### **3. Environmental Impact Assessment-Environmental Management Plan**

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Hubli – Dharwad BRTS Company has conducted an environmental impact assessment, a copy of which has been published on the website [www.urbantransport.kar.nic.in](http://www.urbantransport.kar.nic.in). It is seen that widening of the right of way would require trees to be felled. In the first instance, it has been identified that 1750 trees would have to be felled for the widening of the road from two lanes to four lanes. An amount of Rs.27.24 lakhs was deposited by KRDCL which was responsible for widening of the existing road with the forest department for compensatory afforestation. The affected trees are mostly Banyan, Eucalyptus, Common Fig Tree, Teak, Bamboo and Mango etc. A joint measure survey is in progress and during this process, the trees that need to be felled and existing on private land which is proposed to be acquired beyond the road widening that is under way by the KRDCL would be identified. Only 12 trees are proposed to be cut at the transit infrastructure sites.

The Hubli – Dharwad BRTS Company has also prepared Environment Management Plan (EMP) for both roads and transit infrastructure component. In addition to avenue plantation, 1200 trees are proposed to be planted in the transit infrastructure sites. The EMP prepared for both road and BRT infrastructure have also been published on the website [www.urbantransport.kar.nic.in](http://www.urbantransport.kar.nic.in).

## 4. Key Focus Areas

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### **1. Avenue plantation along the corridor**

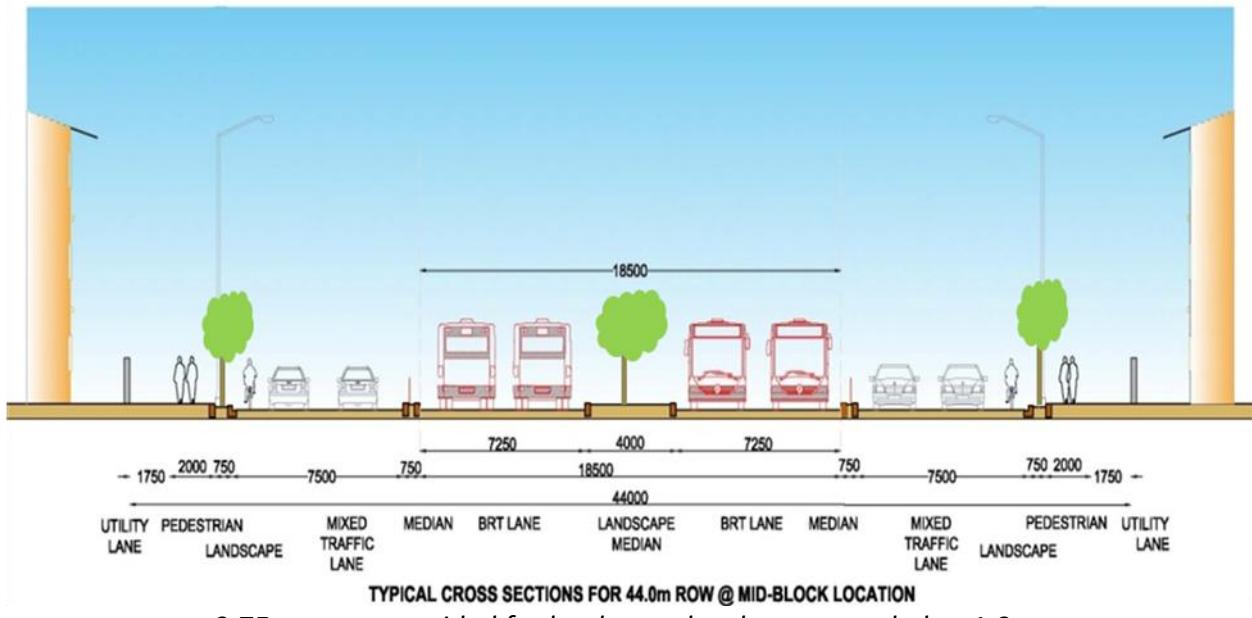
It is envisaged to plant trees at an appropriate interval along the corridor. A plantation zone of one metre width has been provided in the cross-section of the corridor on either side for planting appropriate trees/plants. It is expected that the number of trees to be planted as a part of avenue plantation would be 4000. Endemic care would be taken to ensure that the species selected for the avenue plantation are hardy, able to thrive in the given environmental conditions, and are chosen in such a way that the avenue would have greenery and blooms for the major part of the year. Selection of plants of deciduous nature would be avoided. The fencing of the trees and tree guards would be designed in keeping with the motto of sustainable transport that the Company endorses.

The avenue plantation will be designed in such a way that it is aesthetic, has a proper mix of diversified species as a check against pest proliferation, easy to maintain and where the space permits, there is a provision for street furniture for people to rest.

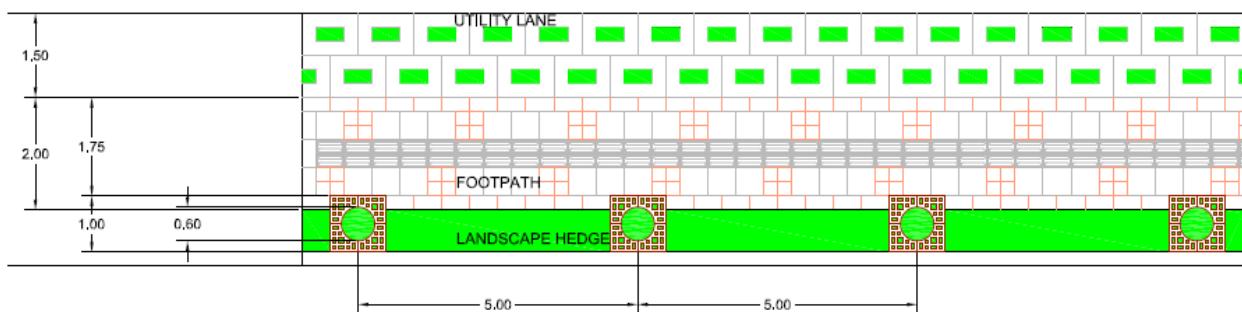
The height of the tree and its eventual branches will have to clear the height of the vehicles. Also, the trees' root structure should grow vertically rather than horizontally as root structures that grow horizontally beneath the

surface are likely cause buckling of the road way materials. Planting would be incorporated as an integral component of noise barrier work to discourage graffiti and address visual impact issues.

**Figure 1: Road Cross-section**



**Figure 2: Strip Plan**



## 2. Plantation within the Bus Terminals

Space has been earmarked along/within the terminals for plantation/landscaping. The plantation/landscaping will be designed along the sidewalks and pedestrian areas as shown in the corresponding designs of transit infrastructure. Niches would be identified for embellishing them with

greenary, and would be used for people to sit, chat or rest. Innovative, comfortable and attractive street furniture would be placed. The niches should be visible to prevent unsavoury uses and would be properly lighted. A mix of trees, shrubs etc would be considered. However, monoculture plantations would be avoided.

**Figure 3: Conceptual Plan of landscaping within bus terminals**



### **3. Plantation in the open area near Sanjeevini Park and other public spaces**

The Company would collaborate with the Forest Department for planting 5000 trees in the open area near Sanjeevini Park and other public spaces. The proposed species would include perennial and tall trees that showcase the bio-diversity of the region.

### **4. Plantation in schools, colleges, institutions and parks**

The Hubli – Dharwad BRTS Company has taken up an exercise of planting 8000 trees in the lands belonging to schools, colleges and public spaces as a part of

its green BRTS programme. Necessary amounts have been deposited with the forest department for procurement of saplings and these would be planted in association with the schools, colleges and general public during the monsoon season of 2013. Schools, colleges, government offices and parks are proposed to be covered under the programme during the year 2013.

### **“Namma Tota @ Green BRTS”**

The Hubli-Dharwad BRTS Company Limited is launching the above movement in schools and colleges of Hubli-Dharwad. The contours of the programme are as follows:

1. The Company would provide saplings of the choice of the school/college at the company's cost.
2. The cost of planting and pitting would be released to the school/college betterment committees by the Company.
3. The school/college must organize pitting as per specifications given by the Company and organize planting as indicated by the Company. The school/college may also identify green BRTS volunteers for monitoring the well-being of the saplings planted in the school/college premises. The responsibility of the school/college and volunteer is to ensure watering of the sapling and facilitate its proper growth.
4. The associated environmental group, if any, would train the green BRTS volunteers in the upkeep of the plant that they have adopted.
5. A health card scoring system would be introduced by which the health of the saplings grown in a school/college premises would be scored at the end of the each year for three years and green BRTS points would be awarded for each year. The school/college would be able to encash the green BRTS points for claiming rewards as mentioned below.

**Award of green BRTS points**

<b>Sl. No.</b>	<b>Growth status of saplings</b>	<b>Green points per sapling that can be encashed by the institution. (in Rs/sapling)</b>
A.	90-100% healthy growth among the planted species	
1	At the end of the first year	22.50
2	At the end of the second year	22.50
3	At the end of the third year	30.00
B.	80-90% healthy growth among the planted species	
1	At the end of the first year	20.00
2	At the end of the second year	20.00
3	At the end of the third year	28.00
C.	70-80% healthy growth among the planted species	
1	At the end of the first year	18.00
2	At the end of the second year	18.00
3	At the end of the third year	24.00

**Tagging of trees:** The Hubli-Dharwad BRTS Company Limited will take up tagging up of trees planted. It is proposed to tie plastic laminated cable wired tags of size  $\frac{1}{2}$ " x 2" to the planted saplings. The tag would indicate "HD-Green BRTS" and the ID number of the sapling.

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## 5. Implementation Framework

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1. The Hubli-Dharwad BRTS Company intends to engage the services of reputed landscape architects for developing a landscape plan for avenue and transit infrastructure. The brief scope of the assignment would include preparation of preliminary landscape design for the BRTS corridor, transit infrastructure etc for approval of the Company after carrying out detailed survey of the existing site and facilities.

Broader Scope of Consultancy services include the following:

1. Conducting the detailed survey of the required parameters in the proposed sites where the landscaping is to be undertaken.
2. Consultants will be required to provide a wide range of services, including but not limited to the preparation of:
  - Concept plans.
  - Detailed landscape plans for each site which would also contain vegetation assessment and planting plans and Furniture details and signage.
  - Landscape construction documentation.
  - Bid documents and cost estimates.
3. Assist the client in evaluation of bids and selection of landscape developers.
4. Monitoring/Supervision during landscaping till the stage of successful completion of project.

2. Plantations in public parks, schools and colleges etc would be organized by the Company in association with Forest department, Environmental groups and school/college betterment committees etc.

**3. Green-BRTS Committee:**

A committee would be set up under the Chairmanship of Managing Director, Hubli – Dharwad BRTS Company with the District Forest Officer; one representative each from the recognized environmental groups registered in Karnataka and functioning for a minimum of three years in Hubli-Dharwad; Executive engineer, KRDCL, Hubli; expert from the University of Agricultural sciences, with the Manager (Environment), Hubli – Dharwad BRTS Company as Convener. The committee shall also review various activities planned for implementation as per the plantation action plan. The committee shall meet once in two months and the proceedings of the meeting of the committee shall be submitted to Commissioner, DULT, Deputy Commissioner, Dharwad and Managing Director, KRDCL for information.

**4. The Plantation Schedule:**

Planting along the corridor and in transit infrastructure would be taken up only after the construction activities are completed. This would mean that the plantation is taken up only subsequent to February 2015. However, plantation will be taken up in schools, colleges and some public places during the 2013 monsoon season, and plantation in other public spaces would be taken up in

the monsoon of 2014. The tentative list of species proposed to be planted is indicated in Annexure. The plantation schedule is indicated below.

**Figure 4: Plantation Schedule**

SI No	Activity	2013			2014				2015			
		Jun	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun	Sep	Dec
1.	Publication of draft plantation plan											
2.	Formation of HDBRTS Environmental committee											
3.	Plantation in schools and colleges and public places											
4.	Plantation in public spaces											
5.	Avenue plantation											
6.	Plantations at transit infrastructure facilities											

## 5. Project cost:

The tentative estimate for plantation is indicated below:

### Estimated Cost for Plantation

<b>Sl. No.</b>	<b>Particulars Year Wise</b>	<b>Unit Cost (in Rs.)</b>	<b>No. of plants</b>	<b>Total Cost</b>
<b>A.</b>	<b>2013-14</b>			
<b>1</b>	Procurement of Sapling	30	8000	240000
<b>2</b>	Cost towards transportation, pitting and planting	58	8000	464000
	<b>Sub Total</b>			<b>704000</b>
<b>B.</b>	<b>2014-15</b>			
<b>1</b>	Procurement of Sapling	30	5000	150000
<b>2</b>	Cost towards transportation, pitting and planting	58	5000	290000
<b>3</b>	Incentive for maintenance of plants under the Namma Tota programme (presuming 90-100% healthy growth among the planted species)	22.5	4000	90000
	<b>Sub Total</b>			<b>530000</b>
<b>C.</b>	<b>2015-16</b>			
<b>1</b>	Procurement of Sapling	30	5200	156000
<b>2</b>	Cost towards transportation, pitting and planting	58	5200	301600
<b>3</b>	Incentive for maintenance of plants under the Namma Tota programme (presuming 90-100% healthy growth among the planted species)	22.5	4000	90000
<b>4</b>	Cost towards maintenance of plants	137	5000	685000
	<b>Sub Total</b>			<b>1232600</b>
<b>D.</b>	<b>2016-17</b>			
<b>1</b>	Incentive for maintenance of plants under the Namma Tota programme (presuming 90-100% healthy growth among the planted species)	30	4000	120000
<b>2</b>	Maintenance of avenue /transit infrastructure/ other plantation	137	10200	1397400
	<b>Sub Total</b>			<b>1517400</b>
<b>E.</b>	<b>2017-18</b>			
<b>1</b>	Maintenance of avenue /transit infrastructure/ other plantation	137	10200	1397400
<b>F.</b>	<b>2018-19</b>			
<b>1</b>	Maintenance of avenue /transit infrastructure/ other plantation	137	5200	712400
<b>F.</b>	<b>Miscellaneous Expenses</b>	Ls		25000
	<b>Total</b>			<b>6118800</b>

## **Annexure**

The tentative list of species proposed to be planted

### **SPECIES**

- Cherry
- Badam
- Basavanpad
- Halasu
- Hulgal
- Nelli
- Tapsi
- Bevu
- Sampige
- Spatodia
- Nagaling
- Mahagani
- Aala
- Arali
- Akash Mallige
- Sankeshwar
- Bamboos
- Hunase
- Nerale
- Ashoka
- False Ashoka

### **UNDERSTOREY TREE AND SHRUB SPECIES**

- *Salvadora persica*
- *Pithecelobium dulce*
- *Abrus precatorius*
- *Butea monosperma*
- *Gliricidia sepium*
- *Murraya koenigii*
- *Murraya exotica*
- *Grewia asiatica*
- *Cordia rothi*
- *Capparis decidua*
- *Wrightia tinctoria*
- *Adhatoda vasica*
- *Thespesia populnea*
- *Tecomella undulata*
- *Cordia myxa*