GEF–SUTP Quarterly Newsletter (India)

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GEF-World Bank-UNDP supported

SUTP Projects

The Sustainable Urban Transport Project which is funded by GEF, World Bank, UNDP and the Government of India. As part of Component 2 the SUTP is funding the implementation of a bus based Intelligent Transport System (ITS) solution in Mysore. The project also funds the dissemination of information to stakeholders, public and private sector organisations and the general public.

The Mysore ITS Project: Sharing our Experience by KSRTC

It is with pride that I say that Karnataka State Road Transport Corporation (KSRTC) continues to be a leader among India's State Transport Units (STUs) by implementing new ideas and concepts. Keeping with this tradition, KSRTC is currently implementing an Intelligent Transport Systems (ITS) on our Mysore city-wide bus service. This is the first project in India to cover the full fleet of a city-wide bus service. The Mysore ITS project is being implemented under the GEF-SUTP Programme.

With the objective of ensuring high quality output, KSRTC in addition to hiring the project implementation vendor - M/s. CMC Limited, has also selected the Project Management Consultancy (PMC) for ITS - M/s. IBI Group and a Monitoring & Evaluation (M&E) agency – M/s. Intercontinental Consultants and Technocrats Pvt. Ltd in a joint venture with Kimley Horn Consulting & Engineering. While the PMC is providing ITS expertise and oversight for the project; the M&E consultants will provide guidance on the benefits that the ITS project accrued for KSRTC through their evaluation over the next three years. The project is expected to be completed in August 2012. This article discusses the implementation challenges faced by KSRTC and the lessons learnt, from my view point.

First, let me start out by giving you an overview of the project. The Mysore ITS project scope is to implement an Automated Vehicle Location (AVL) System and Passenger Information Systems (PIS) on 500 Buses, 105 Bus Stops, 6 Bus Terminals and 45 platforms in the city of Mysore. An illustration of the system is given in Figure 1. The various components of the system are:

- The in-bus vehicle installation consists of : (1) Vehicle Monitoring Unit – a GPS/GSM unit that provides vehicle location and communication to Central Control Station, (2) In-bus PIS–displays current stop/next stop information, and (3) Automatic Voice Announcement (AVA) System – announces the stop reached/next stop to be reached syncing with the In-bus PIS.
- PIS display boards at bus stops and terminals showing Estimated Time of Arrival (ETA) of buses.
- The Central Control Room consists of: (1) Data centre, (2) Control room with video wall and dispatcher workstations, and (3) UPS room.
- The software consists of: (1) Application software with GIS map and supporting features that will help dispatchers to continuously monitor the buses and help KSRTC enhance the bus operations; (2) Enterprise Management Software (EMS) that will monitor the system health.
- MIS Reports: such as driver performance, bunching, over speeding, etc.
- Training: for crew and staff to ensure ITS project success.

Here I want to share what I think other implementation agencies conducting similar projects should pay attention to; I sincerely hope that this article would be a useful read.

Contents:

> "We can constantly make new things but we can't make a new world"
>
> Kentaro Matsuura

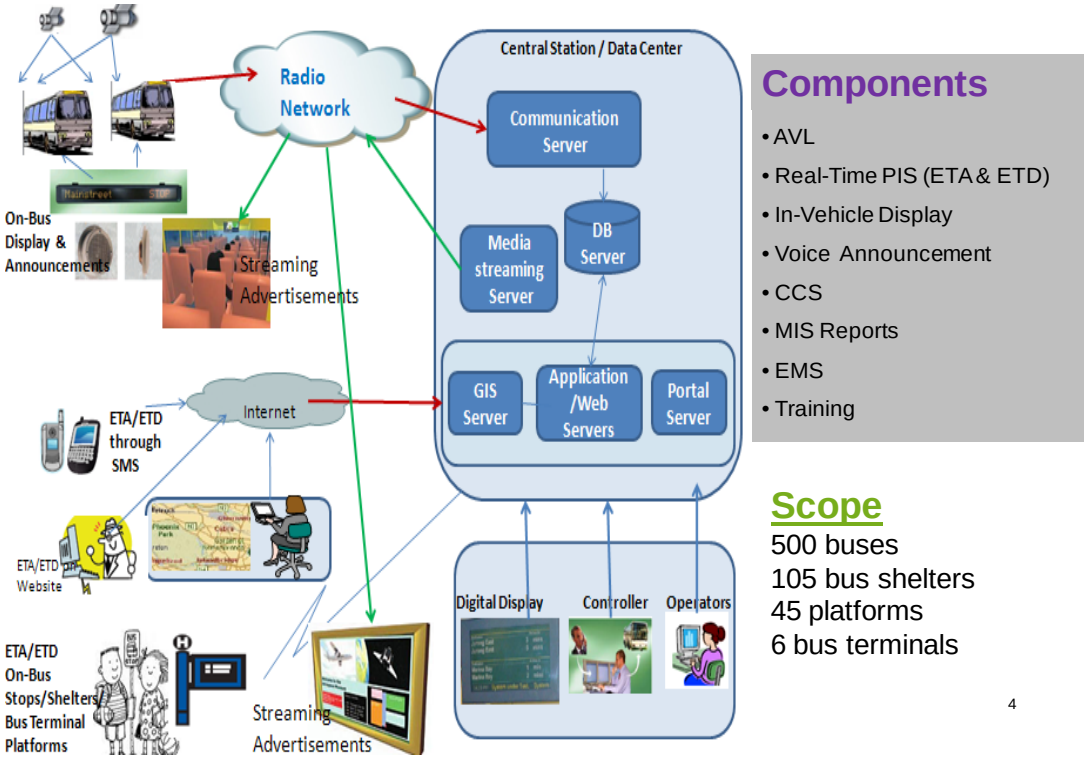


Figure 1 Components of Mysore ITS System

Needs Analysis

An unbiased and detailed "Needs Analysis" should form the basis for any good RFP (Request for Proposals) development. While there was a level of needs analysis conducted for this project in the form of Detailed Project Report, I would have loved to see a needs analysis report or a concept note be developed before drafting of the RFP. In my opinion, looking holistically at the needs might have led us to include some additional components such as fare collection along with the AVL system as part of this project. I urge other STUs venturing on such a project to start with a detailed Needs Analysis report, and then select the scope of the current project.

RFP Development

While we had a very good third party develop the RFP, we have had a few issues due to some ambiguities in the RFP. I would say that those ambiguities are because of the lack of implementation knowledge of ITS in India. For the past couple of months, we have had discussions on PIS board requirements. We had faced issues due to discrepancies in RFP between functional and technical requirements for UPS and Diesel Generator (DG). I have learned from this and many other issues that we should: (1) state requirements for each component only once, (2) ensure that there is no ambiguity in what is required and (3) put oneself in the shoes of the vendor and evaluate how the vendor will interpret these requirements given the Vendor's interest in reducing costs.

Selection of Vendor & PMC

On this project, the PMC was on-board three months after the Vendor as can be seen from Figure 2. From what I can understand now, this created a severe impact on the planning phase of the project where the project requirements could not be frozen in good time. Based on my experience so far, I would recommend a PMC to be installed for any ITS project before the vendor. This will help with ensuring that the project implementation is much smoother. While I believe that the staff of KSRTC could have done some of the tasks of a PMC, on our project the

PMC has been helpful in making us look at multiple implementation issues that we were not exposed due to our current lack of experience in ITS. These include the detailed task list of implementation, the focus on power requirements, the quality of installation, and a hundred other smaller items. The other reason I would recommend a PMC is that you require subject matter experts in technology, communications, transportation, bus operations and field implementation, and you need these people focused on the project. KSRTC felt that since ITS is still not a core component of our business, the external PMC team was very helpful in ensuring that we are getting a quality product.

Figure 2 Snapshot of Project Timelines

Implementation Support

As you can see from Figure 2, even with a PMC on-board helping us with the project implementation, we had multiple delays on the project. Having a good grasp of the complexity of the project, I do believe that our initial timelines were unrealistic. If we had an initial timeline of around June 2012, and worked towards that date from the very start we should have been able to achieve it. As a client we like projects to be done quickly, and the vendors seem to be promising the unachievable from fear of alienating the client. Net impact is the continuous delays on the project. My recommendation is to have reasonable roll out period at the start of the project so that the Vendor has a good chance of hitting the dates.

Project Plan and Defining Process

Now I can see that the Planning stage of the project is extremely important for ITS projects. I now believe that the delays in the Mysore ITS project are related to project tasks that were considered by the vendor. Based on the PMC inputs and my personal experience, I would now recommend planning, design/build of the hardware/software, procurement and finally implementation as project stages as shown in the figure 3 below

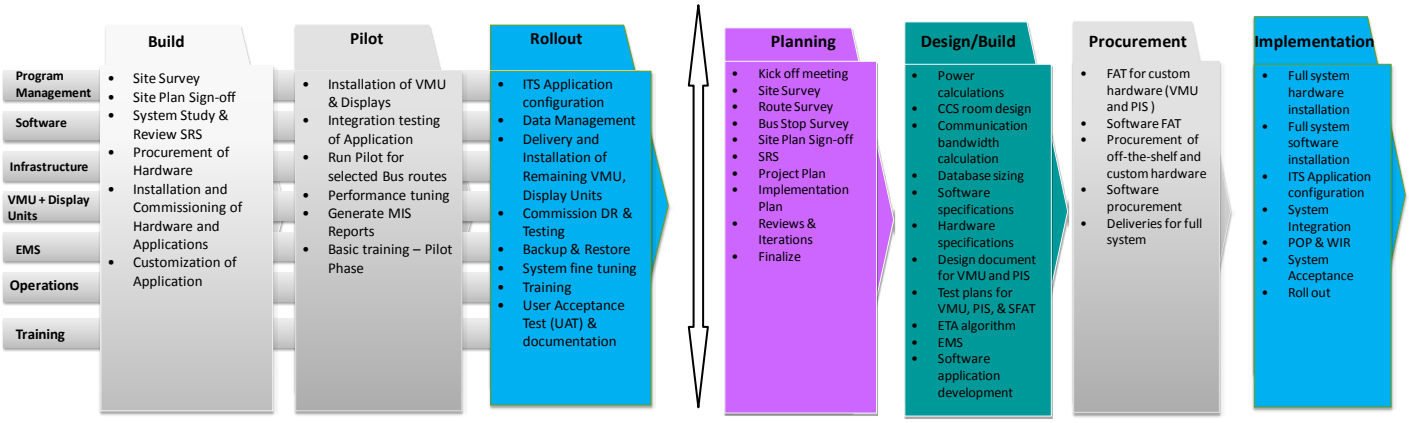


Figure 3: (A) The Project Tasks for Mysore ITS as per Vendor, (B) IBI Group recommendation on Project Tasks for Transit ITS projects

> “Nothing compares to the simple pleasure of a bike ride”
>
> John F. Kennedy

Implementation Plan

An implementation plan forms the first step in ensuring that the Vendor understood the project. For the Mysore ITS project, from an initial implementation plan with 30 tasks, we went to an implementation plan with 185 tasks. There are multiple critical items in ITS projects, so having the detail helps in planning for the unexpected

Documentation

On the Mysore ITS project I am able to see the value of documentation. There are many other documents that formed part of the planning to ensure that the product is stable. I am led to understand that the Power Calculations Document helped the UPS and Diesel Generator (DG) requirements change from 20KVA to 40 KVA and 30 KVA to 55 KVA. Since, power is critical in Indian situation – not getting these calculations right could have led to system failure. Systems Requirement Specification, System Design Document, GPRS network survey, bus stop power availability survey, communication bandwidth calculation and bus equipment installation report are some of the other critical documents that were developed for this project. My review of these documents gave me confidence that the delays are due to the Vendor and the PMC working in a systematic way for providing a stable solution for KSRTC.

Testing

KSRTC had a history of testing its components in great detail and this project is no different. The PMC worked with the Vendor to create detailed test reports for each of the custom hardware and software components. We had multiple issues with the custom hardware submitted by the Vendor that were revealed by the Factory Acceptance Tests (FAT). My understanding now is that good test plans with detailed test procedures will only ensure that the Vendor products meet the RFP requirements, and for this we require well written test plans. An example of test plan is shown below in Figure 4.

VMU Factory Acceptance Test

Test Case . No	Test	Factory / Field	Test Procedure	Fully Demonstrated (Y/N)	Reference	IBI's Observations
1	Vibration & Shock Resistance	Factory	These tests are conducted at Environmental Test Laboratory, Systems & Quality Assurance Group, ECIL, Hyderabad.		SRS 12.1.1	Along each of the three axis, sinusoidal wave type of less than 2g acceleration was successfully passed.
2	Heat Resistance	Factory	These tests are conducted at Environmental Test Laboratory, Systems & Quality Assurance Group, ECIL, Hyderabad		SRS 12.1.1	Ambient to -10 D for 15 minutes, 10 D for 1 hour, -10 to 70 in 1.5 hours, 70 D at one hour was demonstrated.
3	Dust Resistance	Factory	These tests are conducted at Environmental Test Laboratory, Systems & Quality Assurance Group, ECIL, Hyderabad		RFP Page # 155 E-4-b	VMU sealed in fine dust chamber maintained at 40 D for 1 hour.
4	Water / rain Splash resistance	Factory	These tests are conducted at Environmental Test Laboratory, Systems & Quality Assurance Group, ECIL, Hyderabad		RFP Page # 155 E-4-b	Water splashed at static pressure 1.5kg/sq.m through 7 jets at various angles.
16	Temperature Operating -20°C to +70°C	Factory	These tests are conducted at Environmental Test Laboratory, Systems & Quality Assurance Group, ECIL, Hyderabad.		SRS 12.1.1	same as test 1
17	Humidity 5% to 95% RH noncondensing at +40°C	Factory	These tests are conducted at Environmental Test Laboratory, Systems & Quality Assurance Group, ECIL, Hyderabad.		SRS 12.1.1	VMU placed in a chamber at 40 D at 95% RH for 1 hour.

VMU Field Test Cases

Test Case . No	Test	Factory / Field	Test Procedure	Expected Output	Fully Demonstrated (Y/N)	Reference	IBI's Observations
5	Tamper proof and Tampering alerts	Field	• There will be a Hologram Sticker at Screw points of side and back of the cover • There will be a micro switch to the back side cover, whenever back cover opens VMU sends tamper alarm to CCS		Y	RFP Page # 155 (E-4b)	The response time for the alert delivered at the CCS room is slow.
10	Buzzer for incoming call	Field	Covered under incoming and outgoing call Test case 7		Y	SRS 8.1.5.5	The buzzer needs to be replaced/redesigned
23	Long lat - Precision	Field	VMU has GPS debug feature, using this feature take known (authorised by CCS or mutually agreed) location/ position and compare with known value to find the precision.		Y	SRS 8.1.8.1	The longitude and latitude positions of the VMU were cross checked with an external Garmin longlat reader.
30	Touch screen sensitivity & calibration test	Field	Touch screen is not part of the RFP, it may not be made part of the tests.		Y	Not part of RFP. test conducted	The co-ordinate response needs to quick (within 3 seconds)
31	Keys (including Voice Key for emergency numbers) on VMU and their functionality	Field	Demonstrate usage of keys (including SOS key) as part of the test to achieve the navigation and SOS requirements		Y	SRS 8.1.5.5	The key activation needs to be simplified.
32	Data storage Test – 256 MB NAND Flash Data storage, 16 GB SD 1000 routes, with each route up to 100 stops	Field	Test case #8 It may not be made part of the tests.		Y		Storage of 1000 routes to be cross checked by site engineers
43	Dialing of pre-configured numbers (control center, police, fire, ambulance)	Field	Along with Test Case # 7 No "dial pad" is provided. Calls cannot be made to adhoc numbers from the VMU. Only the pre-authorized numbers may be chosen from to make a call.		Y		Pre-configured numbers should only be permitted.
44	Ability to store position data through "dark zones"	Field	Along with Test Case # 8		Y		The dark zone packets need to be analysed and cross checked by the VMU reports.

Figure 4 VMU FAT Tests (Environmental & Field Tests)

Application Software and GIS Map

This was one of the places where the PMC was invaluable. Because of M/s. IBI Group extensive international experience on Transit ITS projects, they were quick to point out the Application Software and the GIS Map were not of the quality required for CAD-AVL systems. We had gone through a list of improvements so that the software is enhanced to help with “Operations” and not just tracking of buses. My hope is that Mysore ITS project will help KSRTC reduce its operations cost as envisaged for deployment of ITS.

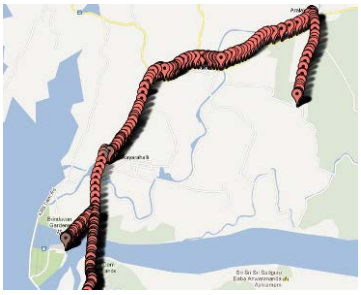
In-bus Installations

Installing VMU, In-bus PIS, Voice Announcement System are not simple. While in the planning phase vehicle installation reports were created, the ground reality of installing was complex and time consuming in the Mysore scenario. Each bus installation, based on bus type, took anywhere from 1 hour to 6 hours. Since the buses are available only in the night for installation, this was another critical bottleneck in the process. We realized the complexity of installation and also the fact that the Vendor was struggling with this process. The reason why our project was more complex than most projects of this type is because we had installation of 4 components and associated wiring. In our case, we reworked a fair bit of the installation in spite of the delays it created, to ensure that the final quality of installation was good.

Figure 5 Various Initial Issues in In-bus Equipment Installation

Route Validation

From a State Transport Unit perspective, ITS provides many new challenges. I believe, we at KSRTC will need some amount of culture change to make this ITS project a success. Some of these issues include:



- Update of Form IV - Form IV is the form which gives the full schedule and bus stop information. With the ITS and Voice Announcement Systems and Estimated Time of Arrival (ETA) calculations requirements, the bus stops, the routes and all other information has to be frozen and needs to be correct at all times. The deployment of ITS requires that we need to simplify some of our complex routes, initially, to ensure that is better cohesion in the schedules in the ITS system and ground operations.
- Route numbers of the buses have to be different if the bus follows even a slightly different path. For example if a bus stops at point x, and another bus stops at point y, which might be just 100 meters away; the routes (303A vs. 303B) needs to different for the ITS system to function correctly. I also finding that the routes between same origin and destination with different via information, now needs to be different routes to comply with the ITS system.

"You are not stuck in traffic. You are traffic"

TomTom satnav advertisement (2010)

System Acceptance

On this project, we still haven't come to the one month no-fault period and system acceptance. But as everyone else on this project, I am starting to see the light at the end of the tunnel. We are expecting to reach near completion by the end of this month.

I am proud to say the whole team (KSRTC, Vendor and PMC) have given their best on the Mysore ITS project. In the big picture and with my understanding of the complexity of ITS projects, my hope is that this crystallizes into a successful project. Till that time, I will keep my fingers crossed. I invite the readers to Mysore and experience the project. You can contact my team at gefmys@gmail.com.

All information, data and the article have been assimilated & written by Shri. N. Manjunatha Prasad, IAS, Managing Director, Karnataka State Road Transport Corporation (KSRTC)

A.B. Road Indore Dissemination Workshop on ITS Project

With the objective of promoting the Sustainable Urban Transport Project and to disseminate information about Bus Rapid Transport System (BRTS) being implemented by Atal Indore City Transport Services Limited, Indore a **Dissemination Workshop was organised on Bus Rapid Transport Systems on 1 June 2012** at Hotel Sayaji, Indore jointly by the Ministry of Urban Development, Govt. of India and AICTSL supported by Global Environmental Facility (GEF), World Bank (WB), United Nations Development Programme (UNDP) PMU SUTP and Mott MacDonald, India. The workshop intended to bring about awareness among various stakeholders and involve the public opinion makers in SUTP activities and sensitize them about the works being carried out by AICTSL under. The workshop was formally inaugurated by the Hon'ble Mayor Indore Municipal Corporation Shri Krishana Murari Moghe with the traditional lamp lighting ceremony in the presence of Shri S.K. Lohia, OSD(UT) & E.O. JS & Shri Yogendra Sharma, Commissioner IMC; Shri I.C. Sharma, National Project Manager, SUTP; & Shri Chandramauli Shukla, CEO, IDA, Indore.

Shri Yogendra Sharma, Commissioner IMC with Shri S.K. Lohia, OSD (UT) & ex-officio JS/ NPD (SUTP), Shri A Manohar SSP & Shri Chandramauli Shukla, CEO, IDA

In his welcome address, Commissioner, Indore Municipal Corporation Shri Yogendra Sharma described how efficient planning of urban transport systems can facilitate sustainable development. Shri Sharma mentioned that the congested conditions in public transport vehicles, stations, and rights-of-way not only slow down travel but make it outright dangerous.

Shri Sharma also mentioned that to make the public transport more sustainable, Indore city is supposed to start the A.B. Road BRTS by the end of this year as pilot project. Shri Sharma also spoke about the merits of BRTS and how city buses have controlled carbon emission in Indore.

Hon'ble Mayor Shri Krishna Murari Moghe Stressed on changing mind set of people as many consider below their dignity to travel by city bus. "City bus services should be attractive enough to address such an attitude," he insisted.

Shri S.K. Lohia, OSD (UT) & ex-officio JS/ NPD (SUTP) in his address shared with the audience the concept of SUTP, uniqueness of the project and how AICTSL is going to implement the first A.B. Road BRT Corridor along with very dynamic concept. He said that in order to reduce the problem relating to transportation more emphasis needs to be given to the area of public transport and Non-Motorised Transport (NMT) instead of private transport.

Shri S.K. Lohia, OSD (UT) & ex-officio JS/ NPD (SUTP) addressing the workshop

Road capacity is limited this is the only way in which the road utilization can be effectively improved. He mentioned that under SUTP, AICTSL is trying to create a model that can be replicated in other Indian cities. He stressed on growing urbanisation has to be driven on urban transport. There is limit to which roads can be widened in cities to accommodate more vehicles. City buses are the best option. He also stated that to run this project successfully, support from the city level administrators and political leaders is essential. He advised the audience to be open to innovative ideas and to find out one's own solutions.

Shri I C Sharma, National Project Manager, SUTP and Shri Chandra Mauli Shukla, CEO, IDA giving the presentations at the workshop

Shri I. C Sharma said SUTP is a movement under which people have to be motivated to leave their private vehicles at home and opt for buses as means of transport. "There is need to integrate town planning and transport planning so that people can have easy access to quality bus service," he remarked. He said that BRTS, developing cycle tracks and pedestrian paths are key aspects of SUTP.
The Technical Session included a presentation by Shri I C Sharma, National Project Manager, SUTP. He revealed figures to show how the "as it is" situation will affect mobility in the years to come and adversely affect the environment. SUTP is a very important concept and its effective implementation alone will help in controlling the situation and ultimately supporting a better environment

Another presentation was by Shri Chandra Mauli Shukla, CEO, IDA. He spoke about the AB Road BRTS features and the difference it can make after it will launch. Also he stressed on the differences with other BRTS in the country.

The next presentation was on ITS given by Shri Deepak Darda, IBI group. The presentation covered the different perspective of Intelligent Transportation System. Also he emphasize on the Automatic Fare Collection system in the public transport especially in the BRTS.

The last presentation was given by Shri Prashanth Bachu, Embarq. He explained the operation plan of the A.B Road Indore BRTS. In the question & answers round many queries were addressed and social person Shri Jagatnarayan Joshi (Transport Expert) explained about the reliability and sustainability of public transport.

The vote of thanks was given by Shri Rahul Shrouti (Project Manager SUTP-GEF ITS).

Project Update

The progress made on various components and sub-components of Sustainable Urban Transport Project since April 2012, is as follows:

Component 1A: Capacity Building of Institutions and Individuals:

Training and Skill Development:

Consultancy for Individual capacity development through training of trainers and training professionals (PC2):
Monthly Progress Notes of June Shared by UMTC on 2 July 12 and a review meeting for PC2 was held on 3 July 12.
The Consultant as per schedule has shared with the reviewers Environmental, Sensitization, Institutional, Demand Estimation, Urban Transport Planning and Contracting Module. Scheduled workshops for review of Environment, Demand Estimation, Urban Transport Planning and Contracting Modules was conducted in Naya Raipur from 6 – 9 August 2012.

Develop Toolkits:

Consultancy for preparation of toolkits (PC3):
The toolkits are being prepared by the Urban Transport Centres of Excellence (COE). Progress note was submitted to UNDP on 1 May 12

The toolkits under preparation are on Land Use Transport Integration and Density of Urban Growth, ITS and Traffic Management, Public Transport and Pedestrian Accessibility, Urban Travel Demand Modelling, Financing and Financial Analysis, Traffic Analysis and Performance

Measurement, Environmental Analysis, Transport Demand Management, Road Safety and Safety Audits, Urban Road Capacity and LOS Analysis, Driving Code and Social Impact Analysis. Except two all other toolkits are progressing well and inception reports have been submitted.

Sub Component 4 - **Dissemination activities:**

- A dissemination Workshop for Indore was held on 1 June 2012. The purpose of this meet was to share information and knowledge on on-going BRTS project being implemented in Indore.
- Seven issues of GEF-SUTP Newsletter have been published and distributed to all stakeholders.
- Website (www.sutpindia.com) is being maintained and updated regularly.

Component 1B: Technical Assistance to the MoUD for improving the National, State and Local Capacity to implement National Urban Transport Policy.

The proposals for following three consultancies have been received are under evaluation:

- Consultancy Services for Developing Operations Documents for Urban Metropolitan Transport Authority (UMTA) and Urban Transport Fund (UTF)
- Consultancy Services to Develop Operations Documents for Traffic Management and Information Control Centre and National Public Transport Helpline
- Consultancy Services to Develop Guidance Documents for Non Motorised Transport (NMT) Plan, Bike Sharing Scheme and Transit Oriented Development

The proposal for the following consultancy has been submitted and draft contract is being prepared

- Consultancy to develop Urban Transport Research Program in India

Replies to the Pre bid queries for following consultancy has been issued to the bidders and proposal submission date was 20 August 2012

- Consultancy Services for Estimation of Green House Gas Emission and Energy Consumption for SUTP demonstration cities.

Expressions of Interest (EOI) for following consultancies have been received on 24 July 2012 and are under evaluation:

- Consultancy Services for Program Evaluation Study of Deployment of Buses by Cities under JnNURM
- Consultancy Services for Preparing Guidelines & Model Contract for City Bus Private Operations

Component 2: Implementation of Demonstration Projects in Selected Cities.

Naya Raipur

- Detailed Project Report for the Bus Rapid Transit System (BRTS) has been submitted by NRDA.
- Under SUTP, NRDA plans to build bikeways and footpaths in Naya Raipur. The consultant for the same has shared alternative design analysis and strip plans.
- The consultant for ‘designing the bus terminals, bus depots, bus shelters & ancillary facilities has been appointed. The bidding documents and final BOQs are being prepared by the consultant.
- The consultant for Transit Oriented Development is now on board and has submitted inception report.
- The consultant for Consultancy for Monitoring and Evaluation is being appointed.
- The RFP for consultancy for Project Management Consultant (PMC) for Intelligent Transport System has been issued to the shortlisted bidders and date of submission was 18 July 12. The proposals are under evaluation.
- RFP for Consultancy for Preparation of Regional Mobility Plan for Greater Raipur Area has been issued to all shortlisted consultants.

The world must learn to work together, or finally it will not work at all

General Eisenhower

Pimpri-Chinchwad

- The progress of the project "Design and Construction of Flyover and ROB at Nashik Phata on Old Mumbai Pune NH-4, including Bridge over the River Pawana" upto the end of June 2012 is about 70%
- The financial progress of the project 'Design and construction of Bridge on Pawana River, Flyover and ROB with Approaches & Ramps on Kalewadi Phata to Dehu Alandi Road' upto March 2012 end is about 15%.
- Proposals for Consultancy for Monitoring & Evaluation (M&E) received from the shortlisted consultants are being evaluated by PCMC
- The TOR for Consultancy for Promotion and Outreach Program (POP) for BRT & Non Motorized Transport (NMT) Systems in Pimpri-Chinchwad is being amended.
- RFP for following consultancies had been shared with the shortlisted bidders and the pre proposal queries have been replied to
    - Consultancy for Preparation of Parking Policy and Master Plan in Pimpri Chinchwad & Access Plan to Bus Rapid Transit System by Pedestrian and Non Motorized Modes for Pimpri Chinchwad BRT Corridors

Indore

- RFPs have been issued to the consultants for two consultancies to be taken up under the Technical Assistance programme
    - Consultancy for Developing an Accessibility Plan to the BRT Corridor in Indore & Communications and Outreach Program for Bus Rapid Transport (BRT) System in the city of Indore

Mysore

- Consultant for Monitoring and Evaluation is on board and M&E baseline survey work has started in Mysore
- The RFPs for Comprehensive Service and Operations Analysis (CSOA) has been issued to all six shortlisted firms on 5 July 2012 and the pre proposal queries are being replied to
- ITS is expected to be launched by September 2012

World Bank Technical Mission

The World Bank Technical Mission visited Pimpri-Chinchwad, Hubli-Dharwad, Indore and Naya Raipur from 8 to 18 June 2012. The main objective of this Mission was to review overall implementation progress and effectiveness of implementation arrangements. Also the mission and cities participated in BRTS workshop conducted by CEPT on Ahmedabad BRTS on 15th June 2012.

Upcoming Events

- Dissemination workshop in Naya Raipur
- Procurement workshop in New Delhi in September
- The next World Bank Implementation Support Mission is scheduled from 20 to 30 September 2012.

For upcoming events/workshops please visit www.sutpindia.com & http://www.iutindia.org

Contact details:

Shri S.K. Lohia, National Project Director / OSD(UT) & Ex-officio JS	Shri I.C. Sharma, National Project Manager	Ms Rachna Kumar, Under Secretary (MRTS IV)	Shri Rajendra Nath, Team Leader
Ministry of Urban Development	PMU, GEF-SUTP	Ministry of Urban Development	Mott MacDonald Pvt. Ltd.
Tel: +91-011-23061114	Tel: +91-011-23062615	Tel: +91-11-23062964	Tel: +91-120-254 3582
Email: sk.lohia@nic.in	Email: iutindia.sutp@gmail.com	Email: rachna86@hotmail.com	Email: sutp@mottmac.com

Newsletter coordinated by: Ms. Surabhi Kureel, Transport Planner, Mott MacDonald

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Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The Brundtland Commission, 1987