

Expression of Interest (EOI)
For
Vehicle Tracking System (VTS)

5th May, 2017

Centre for Development Of Imaging Technology, C-DIT

Chithranjali Hills, Thiruvallom

Thiruvannathapuram – 695027

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INVITATION FOR EXPRESSION OF INTEREST

No. CDIT/5/EOI-RTC/001/17-18 Dated 05.05.2017

Centre for Development Of Imaging Technology (C-DIT) invites sealed Expression of Interest (EOI) from Firms/companies/ institutes/ organisations/ agencies for Providing Vehicle Tracking System.

The EOI Document containing the details of qualification criteria, submission requirement, brief objective & scope of work and evaluation criteria etc. can be downloaded from the website www.cdit.org.

Last date for submission of EOI is on or before **10th May, 2017**.

Sealed envelope marked to the captioned address given below mentioning "EOI for Vehicle Tracking System" on the top cover

"The Registrar, Centre for Development of Imaging Technology (C-DIT), Chithranjali Hills, Thiruvallom PO, Thiruvananthapuram, Kerala –695027"

Sd-
Registrar, C-DIT

Note: C-DIT or any of its designates reserves the right to cancel this request for EOI and/or invite a fresh with or without amendments, without liability or any obligation for such request for EOI and without assigning any reason. Information provided at this stage is indicative and CDIT reserves the right to amend/add further details in the EOI.

Engagement of Firms/organizations/Institutions for providing solutions on Vehicle Tracking System

EOI is invited from reputed agencies / organizations / institutions for providing solutions on "Vehicle Tracking System" on outright sale or on a royalty basis for one the projects to be undertaken and implemented by C-DIT. The objectives and technical requirements are given below:-

1. The Vehicle Tracking System (VTS) shall be part of the Road Transport Corporation computerisation programme and shall include

- a) An Electronic Ticket Machine replacing the present machines employed on buyback basis.
- b) A Vehicle Management Unit (VMU) with GPS to facilitate GIS based intelligent positioning and fleet management.
- c) The e-ticket system shall allow smart card / valid payment options on 6400 ETMS to start with and on new buses at the time of launching
- d) The ETM-VMU solution shall have a backend software capable of
 - Smart way bill generation
 - Scheduling and trip allocation
 - E-ticketing with live updating
 - Smart card based e-ticketing support
 - Integration with RFID
 - Open source database
 - Live MIS , reports and dash boards
 - Bus tracking software with public data
 - Integration with passenger information system being developed by C-DIT
 - Integration with ticket booking and analytics application of C-DIT
 - Integration with MIS application being developed by C-DIT.
- e) The solution provider should agree to provide the ETM-VMU-display unit and browser/mobile solution with IP on a royalty payment mode.
- f) f. Details of all recurring charges for SIM, ETM and VMU/display unit shall be explicitly provided.
- g) g. The details of the cards, chipset, GPS used and database schema should be provided.
- h) h. The vendor should agree to provide support to C-DIT based on the royalty worked out.

2. Detailed specifications are provided as annexure.

Annexure

ELECTRONIC TICKETING MACHINE

Specification of paper roll:

Thermal paper roll : 57 MM width X 40 MM dia. X 15 M long, 55-60 gsm will be supplied by KSRTC.

Features of Server/Client software

1. USER ACCOUNTS
2. AUTHORISATION AND AUTHENTICATION
3. DEPOT DETAILS
4. EMPLOYEE DETAILS
5. TRANSFER AND ALLOTMENT OF EMPLOYEE DETAILS
6. ETM DETAILS
7. TRANSFER AND ALLOTMENT OF ETM DETAILS
8. BUS DETAILS
9. TRANSFER AND ALLOTMENT OF BUS
10. BUS SERVICE DETAILS
11. ADD / EDIT ROUTE
12. DELETE ROUTE
13. TRANSFER AND ALLOTMENT OF ROUTE DETAILS
14. ADD / EDIT CREW DETAILS
15. DIFFERENT TYPES OF FARE ENTRY
16. SCHEDULE DETAILS
17. SCHEDULE / DUTY PLANNING
18. STAFF ATTENTANCE
19. WAY BILL DETAILS
20. ETM FAILURE & SERVICE DETAILS
21. BREAK DOWN DETAILS COLLECTION REMITANCE
DETAILS

USER ACCOUNTS

ADD USER

User ID
User Name
User Password
Confirm Password
Is it admin or not

EDIT USER

Select User ID
Edit User Name
Enter New password
Confirm Password

DELETE USER

Select User ID
Enter Password
Click Remove button

PRIVILAGE SETTINGS

ADMIN

Create User Details
Create route details

Edit route details
View Reports
Transfer data

SUPERVISOR

Create route details
Edit route details
View Reports
Transfer data

USER

View Reports
Transfer data

DEPOT DETAILS Depot Code Depot Name No of Buses
No of Employees No of ETM
No of Routes
No of Schedules in one day No of Trips in one day

EMPLOYEE DETAILS Employee ID Employee Name Employee Address

Employee DOB

Employee Phone number Employee Blood Group Employee Designation Date

of Joining Employee PF No Employment Type

Depot Code

ETM DETAILS

ETM Serial No ETM No

Purchase Date

Depot Code

TRANSFER AND ALLOTMENT OF ETM DETAILS

ETM Serial No

Employee Name

From Depot Code

Current Depot Code

BUS DETAILS

Bus Type Code

Bus Type Name

Bus No

Depot Code

BUS SERVICE DETAILS

Bus Type Code

Service Name

Service Code

Minimum Fare

Route Code

ADD / EDIT ROUTE Route Code Route Name Minimum

Fare

Fare Type (Graph/ Normal) Bus type

Assign privileges (Concession, ST, PASS etc) Stage Name

Distance

Enter Each Fare

DELETE ROUTE

Select route Code

Confirm Password

Click remove button

ADD / EDIT CREW DETAILS

Employee Code

Employee Name

Employee Designation

Route code

Depot Code
ETM No

DIFFERENT TYPES OF FARE ENTRY Normal fare
Graph fare Round fare Circular fare

SCHEDULE DETAILS Scheduled no Route code Way bill no Route
selection Bus Type
Crew selection Depot Code

SCHEDULE / DUTY PLANNING Scheduled No
Route code Crew details Bus type Bus no Date

No of trips Depot Code

WAY BILL DETAILS

Way Bill No
Depot Code
Crew Details
Bus No
Schedule No
Route Details
Diesel Entry
Inspector ID
Inspector Check Status
Date
Time
Depot Code

ETM FAILURE & SERVICE DETAILS ETM Serial No
ETM No
Schedule operated Date
Fault Reported

Fault Identified
Fault Repaired
Servicing date
User remarks
Company Remarks
Depot Code

BREAK DOWN DETAILS

Select Bus No
Select Route No
Enter Scheduled No
Enter Trip No

Date
Time
Remark
Crew Details
Depot Code

COLLECTION REMITANCE DETAILS

Depot Code
Route No
Schedule No
Trip No
Crew details
Way Bill No
Collection Date
Collection Time
Collected Amount
Expense Details

REPORTS TO BE GENERTATED FROM ETM DATA

(To be printed in Dot-matrix printer)

1. ABC route Analysis
2. Actual Km per depot per month
3. Attendance report
4. Bus type wise report
5. Bus Wise report
6. Cash collection report all duty

7. Comparative analysis of depot performance
8. Comparison of Budgeted revenue >= Real revenue
9. Conductor Inspector Report
10. Conductor wise report
11. Crew cash revenue report
12. Daily traffic OPERANDA
13. Depot wise income report
14. Depot wise revenue forgone
15. Duplicate duty on same day
16. Duty revenue
17. Duty Wise Depot report
18. Duty Wise Inspector Report
19. ETM wise report
20. ETM wise revenue passenger pattern
21. Fare Wise report
22. Fleet Status Report
23. Inspector Report
24. Irregular Conductor And Driver

25. Kilometer operated by different depot
26. Late Duties
27. List of duties - hrs worked
28. List of employees - hrs worked
29. Management Comparative analysis
30. Management private hire report
31. Operational Traffic statistics
32. Passenger Composition depot wise
33. Peak revenue report
34. Report Of ticket roll issued
35. Route Departure
36. Route Wise income report
37. Route Wise Inspector Report
38. Route wise revenue pattern
39. Stage wise survey
40. Stage wise ticket sold
41. Total Remark For Employee
42. Traffic Performance Report
43. Traffic revenue
44. Trip wise tickets issued
45. Trip wise total
46. Bus warrant detailed report

TICKET MACHINE DETAILS

Proposed format for data transferring from ETM Waybill

information to be Loaded in the ETM

Waybill No, ETM No, Cond.ID, Dvr ID, Bus No, Date, Time

Eg. 0280800000 28001 327050 405000 RRC350 dd/mm/yy

Following data should be transferred to the computer after finishing duty and displayed at the top of the ticket war statement uploaded.

W.B.No, ETM No. Cond.ID, Dvr.ID, Busno, Date, Time, Total
Collection, Total Trips, and Total Diesel.

Eg:(0280800000 28001 332705 440500 RRC350 dd/mm/yy 20.00 99999.00 04 125

Ticket issual:

Trip.No FT.No Tktno S E F H L P TIME Fare

01 200 00002468 02 05 01 00 00 00 14:34 0001800

Marking of flags

Trip close

Eg: 01 200 00002468 02 05 01 00 00 00 14:34 0001800 01 Means
Trip close
02 Means Schedule close

All journey passes

1. Concession Ticket

Eg: 01 200 00002468 02 05 01 00 00 00 14:34 0001800 S S Means
concession ticket

2. Duty pass

(a) Office pass (green)

Eg: 01 200 00002468 02 05 01 00 00 00 14:34 0001800 A A Means
Office pass (green)

(b) Metal pass

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 B
B means metal passes

(c) Through out system (red)

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 C
C means Throughout system (red)

(d) Duty check pass

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 D D means
Duty check pass

(e) Casual labour pass

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 G G means Casual labour
pass

(f) All Empanel pass

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 I I means Empanel pass

3. Privilege passes

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 J J means (Privilege passes)

4. Family passes

(a) Employee

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 K K means Employee family
pass

(b) Pension

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 O O means pension family
pass

5. Press

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 Q Q means Media pass

6. Complimentary pass

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 R R means Complimentary pass

7. Freedom Fighter passes

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 U U means freedom fighter passes

8. Pension pass(yellow)

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 W W means Pension pass (yellow)

9. MLA/MP/Ex.MLA

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 X X means Mla/MP/Ex.Mla pass

10. Blind

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 Y Y means Blind pass

11. Duff & dumb (50% ticket rate) (Ticket to be generated)

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 Z Z means Duff & Blind

Brake down place entering

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 a a. means BD

Bus Warrant tickets: Journey ticket should be generated with marking

Bus Warrant

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 b b. means Bus warrant

Local Tax Receipts: (No Ticket generation, only save in memory)

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 c c. means Local tax

Reservation: (No Ticket generation, only save in memory)

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 d d. means
Reservation

Mentally retarded: (50% ticket rate) (Ticket to be generated) Eg: 01 200
002468 02 05 01 00 00 00 14:34 0001800 e
e. Mentally retarded

Season tickets:

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 f f. Cession
tickets

Cancer patients:

Eg: 01 200 002468 02 05 01 00 00 00 14:34 0001800 g g. Cancer
patients

Checking the ETM at the start of a duty

COLN key Function:

1. Way bill details should be shown in the ETM and ca printout shall be taken only before issuing a ticket.
2. Next Fare Table selection only after Closing the previous Journey.
3. Total Collection and Total no Insurance Cess shall be displayed separately.
4. Total Bag collection (except Bus Warrant amount and Local Tax) (only view)

JOURNY REPORT

1. When Journey key is entered, the following details shall be listed (only view)
 - a. Total number of passenger, full, half, lug, PHC, passes
 - b. No of tickets issued in the present stage.(Full, Half, Lug, PHC, Passes)
 - c. No of Passengers to alighted in the very next stage (Full, Half, Lug, PHC, Passes)
2. Journey report: shall be displayed in the ETM at any time during a journey (only view). Display shall be as noted below.
 - i. Trip no, Starting number of ticket, Ending number, Total Passenger
Eg: 1 00000001 00000025 25
 - ii. Total number of passenger declassified as, full, half, lug, PHC, passes
3. Ticket war details: shall be displayed showing the Trip no, Boarding place,

a. Alighting place, Type of tickets, Fare (only view).

Trip sheet select option:

1. Close Trip

Option for entering Trip Canceled Kilometer if any (This should be deducted from the total scheduled kilometer)

2. Details of Single trip :

Trip no, type of total tickets and split up details, Total number of Insurance cess.

3. Journey details after closing trip:

Display details of all trips and a total given number of ticket last issued.(only view)

Luggage & Half Calculation:

As reviles in the existing ETMs to all types of service including I/S. (only for single fare calculation tickets no issued for two tickets)

Insurance cess to all tickets values Rs.25/- and above in Fast Passenger and above class of services including I/S

Physically challenged Passes

Instate services Ordinary and Fast Passenger type 30% of single fare Tickets Super Fast and above service not working in the faculties.

In the case of issuing a single ticket to more than 9 passengers (Ask a confirmation question) Give limit for issue maximum of 99 tickets.

Provision to generate all fare tables from ETM (Only before issuing tickets)

The format of printout should be shown as Rout nos., Start Destination, End destination

Fare table for downward Journey should be automatically generated by ETM.

Manual Reservation Ticket Entry: (Total Function key)

Give provision to input ticket numbers of manually reserved tickets. The value of such tickets should not be calculated as conductor's collection but for the calculation of EPKM and total passengers only)

Repeat Ticket:

Default should be for issue of 1 ticket

Total collection details up to 10 days shall be kept in memory and display.

Waybill No., Last issue ticket no, Reset time, Reset date, total colln for every day

Ticket Printing format:

Length of each
Ticket should be 5
cm

KERALA SRTC				
Name of depot				
Ticket no				Date
Time				
Service Type				Bus No.
Start stage	-- End stage (Name of place)			
Included Cess Amount: ` .01				
Full: 1 * 1.00 = Rs 1.00 (Type of ticket)				
` . 1.00 (Big size)				
Waybill No	CrNo	DrNo	Vhlno	ETM
No				
Not transferable				
Machine No				
Land / Mobile Phone no				
Liable for inspection				

Various types of tickets to be issued from ETM

- ADULT TICKET
- CHILD TICKET
- LUGGAGE TICKET
- BUS WARRANT TICKET
- PHYSICALLY HANDICAPPED TICKET
- DEAF & DUMB TICKET
- MENTALLY RETARDED TICKET
- CANCER PATIENT TICKET
- PROMOTIONAL DESTINATION TICKETS
- PRIVATE RESERVATION

REDEMPTION TICKETS (POLICE WARRANT TICKETS)

These tickets are generated against a redemption token carried by the passenger. As there would be no cash collected against these tickets, they are separately shown in totals.

PAYMENTS

Various payments that are made by BUS CONDUCTOR are made through the ETM. Some of the payment mode available is:

- BUS STAND/PARKING FEE
- TOLLGATE FEE
- DIESEL PAYMENT¹⁹
- LUBRICANT PAYMENT
- Etc

INSPECTION DETAILS

Checking inspector takes a print of details of passengers on board and ticket details and verifies them. If a malpractice is found, inspector has provision to book a case, issue an unpunched ticket.

VARIOUS BUS TYPES

CITY, ORDINARY, LS ORDINARY, TOWN TO TOWN, CITY FAST, FAST PASSENGER, L S FAST PASSENGER, SUPER FAST PASSENGER, SUPER EXPRESS, SUPER DELUX, LIGHTNING , SEMISLEEPER, AC, LUXURY, LOWFLOOR A/C and LOW FLOOR NON A/C with different fares.

Season- based automatic ticketing, Changeover of fare at midnight of the designated season change date etc should be made available.

SMART CARD

Contact-less RFID based SMARTCARD, card reader/writer is built in to ETM for passes authentication.

PASS usage

When a pass-holder boards the bus and just shows the PASS to ETM Authentication & Redemption. When a PASS is brought near the ETM, it checks for validity of date, route, stage, currency etc and registers the same in ETM. If the card is of Redemption type, it deducts the value and from SAMRTCARD.

Recharging of SMARTCARD

The smartcard can be recharged with specific denomination by the conductor in the BUS itself by collecting cash from pass holder.

Process time

The entire process or authentication of pass takes less than a second, and enables simultaneous verification of more passes as well.

FUNCTIONAL FLOW

Conductors are given GPRS/GPS enabled ETM, before starting a new schedule. Before the ETM is issued, Crew allocation is done. The running WAYBILL NO in the depot, CONDUCTOR ID, DRIVER ID, BUS NUMBER are loaded to ETM.20

ETMs shall be provided with communication hardware to enable connection with CENTRAL SERVER CONTROL ROOM. As the conductors issue tickets in a moving BUS, the tickets data may be firstly stored in ETM FLASH memory, and immediately transmitted to Central Control Centre online (Ticket numbers should be continuous) which will be according to the network availability.

GPRS communication in a moving vehicle is not assured due to poor signal strength that occurs due to far off GSM TOWERS. When this occurs, ETM is not ONLine with the CCC, momentarily. However in the event of conductor issuing tickets while the ETM is OFFLINE, the ticket gets stored in the FLASH, and the same is transmitted when ETM goes ONLine.

As the bus reaches the end of scheduled trip, conductor closes the trip by using the TRIP closing function in the ETM. Once the trip is closed, conductor shall not be able to issue tickets further. Hence it comes to a logical end of the conductors' duty for the day. The SCHEDULE CLOSE status is sent to the control server and the same will consolidate, data for the respective schedule and prepare the audit data ready for the depot cashier to use the same. After the conductor reaches the depot, the cashier either enters the waybill no or the conductor ID number, and brings up the audit page.

DEPOT Level Software - BUSES WITH RESPECT TO WAYBILLS IN THE FIELD

This menu will be normally used by Unit / Depot authorities, to view the BUSES belonging to respective depot for on line monitoring. This menu will be used by the concerned officials, to make traffic analysis and to ascertain the ticket sales in routes. The online information shows buses running with less than scheduled no of passengers or less than the schedule collection amount. Various such reports and MIS dashboards should be incorporated.

BUS TRACKING ON MAP- GPS TRACKING SYSTEM

The BUS, with the ETM & equipped with GPS will be interconnected over wi-fi and, continuously send the LATITUDE, LONGITUDE of the location where the bus is located. This data is used to determine the location of the BUS on the MAP. As the BUS moves, the same shall be displayed on the MAP online.

This data can also be used to check the speeds at which the BUS is driven, and hence the indication of over speeding/ route violation / tracking and can integrate for Passenger Information System for live information. We can use this for monitoring the Buses and analyze the behaviour of driver on the route.