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BEFORE THE HONOURABLE HIGH COURT OF KERALA AT ERNAKULAM

WP(C) No.19992/2023

V.D. SATHEESHAN M.L.A. & ANOTHER : Petitioners

Vs

STATE OF KERALA & OTHERS : Respondents

COUNTER AFFIDAVIT FILED ON BEHALF OF THE FIRST RESPONDENT

Sd/-
E-VERIFIED
GOVERNMENT PLEADER
GP-2

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V.D. SATHEESHAN M.L.A. & ANOTHER : Petitioners

V/S

STATE OF KERALA & OTHERS : Respondents

INDEX

SL	Contents	Page Nos
1	COUNTER AFFIDAVIT FILED ON BEHALF OF THE FIRST RESPONDENT	1-37
2	Exhibit R1(a) : True copy of G.O. (MS) No.76/2015/ TRANS dated 21.11.2015 with English translation.	38-42
3	Exhibit R1(b) : True copy of the detailed project report dated 30.06.2017 on road safety to reduce the road accidents in the State of Kerala, submitted by Sri PD Sunil Babu, Traffic Safety Expert, Kerala Road Safety Authority	43-78
4	Exhibit R1(c) : True copy of the Letter No. E1/ 12861/2013-TC dated 20.01.2018 of the Transport Commissioner	79-80
5	Exhibit R1(d) : True copy of the 'Safe Kerala – proposal for separate enforcement wing of Motor Vehicle Department to the Government of the Transport Commissioner	81-102
6	Exhibit R1(e) : True copy of the Minutes of the meeting held on 07.08.2019 at the South Conference Hall, Secretariat, Thiruvananthapuram and chaired by the Honourable Minister for Transport, Kerala	103
7	Exhibit R1(f) : True copy of the detailed Project Proposal for Advanced Automated Traffic Enforcement System and Facility Management Services under the Safe Kerala Project submitted by KELTRON to the Motor Vehicles Department, Government of Kerala	104-211
8	Exhibit R1(g) : True copy of the Evaluation Report dated 22.10.2019 of the Technical Committee of the Safe Kerala Project	212-219
9	Exhibit R1(h) : True copy of G.O. (Rt) No. 559/2019 Transport dated 17.12.2019	220-221
10	Exhibit R1(i) : True copy of the Minutes of Technical Committee meeting held on 28.12.2019	222-224

Sd/-
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BEFORE THE HONOURABLE HIGH COURT OF KERALA AT ERNAKULAM

W.P.(C) No. 19992 of 2023

V.D. Satheeshan M.L.A and another : **Petitioners**

Vs.

State of Kerala and others : **Respondents**

COUNTER AFFIDAVIT FILED ON BEHALF OF THE FIRST RESPONDENT

I, Biju Prabhakar, aged 58 years, S/o. Late Thachady Prabhakaran, residing at Thachadiyil (H), Thirumala P.O. Thiruvananthapuram – 695 006, do hereby solemnly affirm and state as follows:

1. I am the Secretary to the Government of Kerala, Department of Transport, Government Secretariat, Thiruvananthapuram. I am conversant with the facts of the case, as revealed from the relevant files, and am competent to swear to this affidavit. I am swearing to this counter affidavit for and on behalf of the respondents 1 to 5 in the captioned Writ Petition, for which I am duly authorised.

2. This counter affidavit is not being filed by way of paragraph wise reply to the averments, allegations and contentions in the Writ Petition. However, all the allegations, averments and contentions in the Writ Petition have been dealt with hereunder. The omission, if any, to advert to any such averment

or allegation or contention is not willful; may not be treated as admission of the same; and may be permitted to be controverted or otherwise dealt with by way of oral submissions.

3. As per Order dated 20.06.2023, notice on admission has only been issued in the Writ Petition. It is prayed that the respondents 1 to 5 may be permitted to reserve their rights to file a further additional counter affidavit in the event of this Writ Petition being admitted to the files of the Honourable Court or if deemed necessary later on.

4. The Writ Petition is not maintainable either in law or on facts. All the averments, allegations and contentions in the Writ Petition, save those that are expressly admitted or otherwise traversed hereunder, are denied.

5. The Writ Petition has been filed praying, inter alia, for a Court monitored enquiry into the project for Automated Traffic Enforcement System for Safe Kerala and its execution. It is trite and settled law the writ court is not an appropriate forum for initiation of an investigation or an enquiry. Further, the allegations made by the petitioners, purportedly based on which the relief for court monitored investigation is sought, are vague, very much generalised and not at all substantiated by any worthy evidence, save certain bald averments and self serving statements amounting to innuendos. It is most humbly submitted that it is also no more res integra that praying to a writ court to take cognizance of generalised submissions is nothing but an abuse of the process of the Court.

6. It is trite and settled law that the bonafides of the petitioners who file a

Public Interest Litigation is an extremely relevant consideration which requires examination by the Court at the threshold itself, irrespective of the seemingly high public cause being espoused in such Public interest Litigation, and that the writ jurisdiction exercised by this Court cannot be turned into an instrument of partisan considerations. This Writ Petition has been instituted by the petitioners, who are leaders of the Opposition in the State, solely motivated by political considerations, in so far as they, except making certain generalised averments, have not made out any specific case of illegality in the impugned proceedings. As will be discernible from the pleadings herein below in this counter affidavit, the petitioners have filed this writ petition without collecting sufficient basic data regarding the SAFE Kerala Project and without properly comprehending the scope and purport of the Automated Traffic Enforcement System. The entire allegations and averments in the writ petition are in the nature of surmises and conjectures.

7. The petitioners have admittedly not given any complaint to any statutory authority. The attempt of petitioners is to cause a fishing and roving enquiry, to find out whether there is any illegality, and not to cause an enquiry into any specific illegality. The petitioners have simply rushed to this Hon'ble Court without availing alternative remedies, if at all, for argument's sake, there was any such illegality (not admitted that there is any such illegality).

8. The other reliefs sought for in the writ petition (reliefs i, ii and iv) are in the realm of contractual and tender matters. The petitioners, except bald

averments and unsupported self serving assertions, have not made out any cogent case of arbitrariness, bias, irrationality, unreasonableness or malafides in the impugned proceedings. The impugned proceedings are not violative of any statutory or constitutional provisions. In the said circumstances, the petitioners are not entitled for reliefs i, ii and iv sought for in the writ petition.

9. Exhibit P3 Government Order, giving administrative sanction for implementation of Fully Automated Traffic Enforcement System, is dated 27.04.2020.Exhibit P4 work order issued by the Transport Commissioner to KELTRON is dated 14.05.2020. Exhibit P5 service level agreement executed between KELTRON and Motor Vehicles Department is dated 28.05.2020. Exhibit P6 tender document is dated 26.06.2020. Exhibit P14 service level agreement is dated 01.10.2020. The technical installations were completed, in full public glare, by June 2022. Substantial portion of the installation (650 in number) was, in fact, even completed earlier. The petitioners had chosen to challenge the same by way of a Writ Petition presented on 19.06.2023. The Writ Petition is, therefore, highly belated. The Writ Petition is liable to be rejected on this sole count alone.

10. This Hon'ble Court, as per order dated 20.06.2023, gave liberty to the petitioners to file affidavit on the standards they adhere to their heart and their practices in public life. Though the first petitioner has filed an affidavit dated 29.06.2023 and the second petitioner has filed an affidavit dated 06.07.2023 purportedly in compliance of the order dated 20.06.2023 of this Hon'ble Court, it is most humbly submitted that both the affidavits are not

in compliance of the said Order dated 20.06.2023 of this Honourable Court.

11. The averments, allegations and contentions to the effect that the illegalities and corruption attached to the installation of Artificial Intelligence Camera in the State resulted in nepotism, favouritism and corruption including violation of privacy; that the pyramid style of corruption was structured in such a manner, right from the stage of issuance of the Government order and the order issued by KELTRON, by projecting the same as BOOT model with five year warranty, which in practice has turned to be a CapEx model; that the public revenue had eroded as a result of the transaction which culminated in Government Order dated 18.04.2023 enrooting or channeling the benefit primarily to two entities which had come out through backdoor; that in reality, persons behind the two entities were persons closely associated with those in the corridors of power; that their real presence could be seen, only on lifting the veil; that the data base management including access to the server, were kept by the 7th respondent, a private entity, which had no legal authority for collecting and keeping the data; that those details would come up, if an independent an impartial inquiry/investigation was conducted; that the award of contract and the manner in which the files had moved would show the cartel formation to favour the 7th and 9th respondents to siphon the public funds; that the investigating agency of the State was under the command and control of persons who were the beneficiaries of the transaction; that though there were capable officers in the State, both in the investigation wing and the administrative wing, they were obediently acting on instructions from the office of the party having control over administration, a stage which the

State have never seen before; that they were even registering crime as directed or desired by the party higher-up even without a preliminary enquiry; and that a court monitored investigation through State or central investigating machinery or as may be decided by the Court alone would infuse confidence in its endeavour to bring in, the real culprits behind the corruption, are all wrong and hence denied. It is reiterated that they are all generalized averments, in the nature of vague and unsubstantiated allegations.

12. The contentions averments and allegations to the effect that the cost model/financial modeling stated by KELTRON was found to be rudimentary and lacking in analysis; that the cost estimate prepared by KELTRON could not be believed as it did not have the capacity to produce the components nor did it have supply orders or other details to justify the cost assessment; that the most important recommendation of the Chief Technical Examiner that a comprehensive technical and financial proposal detailing the technical requirements with detailed specifications and the cost of each component be prepared was conveniently ignored while issuing the order; that the technical committee, in violation of the requirements of G.O.(Ms) No. 18/2017/ITD dated 23.07.2017, gave a blanket approval without reviewing whether the specifications and the item wise price are correct; that the same was further whitewashed in Exhibit P3 administrative sanction; that the Government, over ruling all objections, had paved way for a project which was ill conceived and ill-planned and was for the benefit of those people who held sway over the Government for their own selfish interest; that how and in what manner these figures have been arrived at

even before inviting a competitive tender cannot be seen from any transparent official records; that all the actions stated as above are without undertaking a detailed work study or cost benefit analysis by the Departments on their own as if the price of the components have come from heaven; and that K-FONE project was yet another scam, are also wrong and hence denied.

As regards Safe Kerala Project and the events that led to Exhibit P3 administrative sanction for the implementation of the Fully Automated Traffic Enforcement System

13. The vehicle population of Kerala is one of the highest in India. Kerala has 1.69 Cr vehicles (as per PARIVAHAN website of the Government of India) for a population of 3.34 crore. The rate of accidents, fatalities and injuries is higher than the national average. Kerala stands fifth among States of India in the number of accidents. Reduction of fatalities/injuries resulting from road accidents can be achieved by promoting safe road and driving behaviour through better engineering standards, greater public awareness, and enforcing compliance of traffic rules/regulations. Since the manual enforcement for reduction of accidents/fatalities/injuries was not effective, the Government of Kerala, also on consideration of the directions of Committee on Road Safety appointed by the Hon'ble Supreme Court, directed the Transport Commissioner, Kerala, to initiate some significant and result oriented steps in the field of road safety in order to minimise the number of road accidents and fatalities on roads. Sri. P.D. Sunil Babu, who was the Special Officer, Safe Zone Project, Sabarimala was entrusted, as per letter number 180/A1/KRSA/2016 dated 24.03.2017 to prepare a detailed

project report to reduce the accidents. Sri. P.D. Sunil Babu, retired Regional Transport Officer (Enforcement) was appointed as Traffic Safety Expert in the Kerala Road Safety Authority as per G.O. (MS) No. 76/2015/ TRANS. A true photocopy of G.O. (MS) No.76/2015/ TRANS dated 21.11.2015 with true English translation is produced herewith and marked as **Exhibit R1(a)**. This was at a time when the second among the petitioners was a Member of the Council of Ministers of the State. Thus it can be seen that the allegation that the origin of Sri. P.D. Sunil Babu *was from the air*, is without any basis.

14. In response, Sri. P.D. Sunil Babu submitted a report dated 30.06.2017. The report envisaged a road safety mission, identified the strategies for minimising accidents and smooth regular transportation, streamlined the targets to be achieved, dealt with reasons for accidents, the causative factors and mitigating measures, projected the key action areas, recommended putting up of control stations in every district and proposed increased staff pattern for the Motor Vehicles Department.

15. The report mentioned about the figures showing reduction in accidents due to implementation of "Safe Zone" in Sabarimala during the pilgrimage season from the 16th of November, 2016 to the 20th of January, 2017. It was pointed out that if the "Safe Zone" project implemented in Sabarimala was extended to the whole of Kerala, it would produce "immediate and valuable results". The proposal envisaged 14 fully equipped control stations, creation of posts from Regional Transport Officers (RTO(s)) to peons, purchase of 65 vehicles, installation of wireless systems, patrolling teams etc. The proposal also recommended installation of surveillance cameras enroute

National Highways, State Highways, other important roads, junctions and check posts, which were to be connected with control stations of each districts. It was projected that the State could generate an income of Rs.250 Crore/year from compounding fees, apart from achieving total control of traffic, security and confidence of the people.

16. The Transport Commissioner, as per Letter No. 180/A1/KRSA/2016 dated 29.07.2017, forwarded the report of Shri.P.D.Sunil Babu to the Government. A true photocopy of the detailed project report dated 30.06.2017 on road safety to reduce the road accidents in the State of Kerala, submitted by Sri PD Sunil Babu, Traffic Safety Expert, Kerala Road Safety Authority is produced herewith and marked as **Exhibit R1(b).**

17. The proposal was examined at the Government level and the Secretary to the Government, Department of Transport, based on the discussion with the Principal Secretary, Finance, issued directions to the Transport commissioner as per Letter No.377/Secy/Trans dated 27.12.2017, inter alia, to the effect that the vehicles along with driver be taken on wet lease for a period of 3 years; that the control room could be outsourced and only RTO and Motor Vehicle inspector (MVI)/ Assistant Motor Vehicle Inspector (AMVI) need be posted by the Department in the control room; that the processing should be done by the agency to which it had been outsourced, as done in the Passport Seva Kendras; that the Request For Proposal (RFP) had to be prepared by the Transport Commissioner; and that traffic wardens could be outsourced to assist the MVIs in the enforcement activities. The Transport Commissioner was also directed to rework the cost of the project on the basis of the directions and submit the same to the Government.

18. On the basis of the above directions of the Government, the Transport Commissioner, as per Letter No. E1/ 12861/2013-TC dated 20.01.2018, submitted a revised proposal named 'Safe Kerala - proposal for separate enforcement wing of Motor Vehicle Department to the Government. In the above said letter, the Transport Commissioner submitted that the proposal to outsource activities was not feasible as collection of remitted cash by the contract employees, if resulted in embezzlement and misappropriation by them, would not be able to be recouped by fixing responsibility; and since statutory functions could not been trusted to such out sourced staff, as it would result in adverse legal implications.

19. The Safe Kerala proposal forwarded by the Transport Commissioner contained proposals for setting up additional 51enforcement squads, 14 control rooms, details of permanent staff as well as daily wagers, infrastructure and equipment for control rooms, recurring expenditure etc – the total cost amounting to Rs.127.18 Crore. In the proposal, it was also mentioned that the compounding fee collection had increased from Rs.40.5 Cr in 2011-12 to Rs. 56.43 Cr, when 17 enforcement squads were deployed and from Rs.81.55 Cr in 2014–15 to Rs.86.24 Cr 2016-17 when 34enforcement squads were deployed. The Transport Commissioner projected the compounding fee collection anticipated when the "Safe Kerala" project was implemented to be over Rs.300 Cr. A true photocopy of the Letter No. E1/ 12861/2013-TC dated 20.01.2018 of the Transport Commissioner is produced herewith and marked as **Exhibit R1(c)**. A true photocopy of the 'Safe Kerala – proposal for separate enforcement wing of

Motor Vehicle Department to the Government of the Transport Commissioner is produced herewith and marked as **ExhibitR1(d)**.

20. On the basis of the report of Sri. P.D. Sunil Babu and on the basis of Motor Vehicle Departments' SAFE Kerala proposal for separate Enforcement Wing submitted by the Transport Commissioner to the Government, the Government, as per G.O. (MS) No. 42/2018/ TRANS dated 04.06.2018, created 262 additional posts in the Motor Vehicles Department for the implementation of safety Kerala project.

21. A committee under the leadership of Shri. Shibu K Itty, Regional Transport Officer, Alappuzha was constituted by the Transport Commissioner to study the requirement of manpower, information technology and other infrastructural facilities and gadgets for the smooth and effective functioning of SAFE Kerala control rooms and for development of the templates. Shri. Shibu K Itty, the Nodal Officer, Safe Kerala and the Regional Transport Officer, Alappuzha submitted a report dated 10.05.2019 in this regard to the Transport Commissioner. The Nodal Officer, Safe Kerala Project, later submitted a detailed report dated 21.06.2019 to the Transport Commissioner, covering all aspects of the control rooms proposed to be established in 14 districts along with the required infrastructure, office interiors and deployment of modern equipment including cameras with artificial intelligence facilities to detect the offences automatically. The Project report envisaged setting up of the control rooms proposed in all 14 districts along with the required infra structure, office interiors and deployment of modern equipment etc. The project report proposed two models (1) Capex Model costing approximately. 79 Cr and

(2)Build own Operate Transfer (BOOT) – Annuity model costing rs.150 Cr and with guaranteed Quarterly payments for 5 years. The report was forwarded to the Government by the Transport Commissioner on 27.07.2019. The same report, with date 17.06.2019, was earlier forwarded directly by Shibu K Itty, Nodal Officer, SAFE Kerala to the Government. It was a general outlay which culminated in the Automated Traffic Enforcement System.

22. Though the necessary posts were created and the vehicles were deployed, there was no progress in the setting of necessary infrastructure for automated traffic enforcement. There occurred delay in inviting the Request for Proposal for setting up of the necessary equipment for traffic surveillance. Government also understood that the Motor Vehicles Department lacked expertise in implementing and operating such a technically complex automated enforcement project. Thus the assistance of KELTRON was sought in setting up the equipments for control room.

23. A meeting, chaired by the Honourable Minister for Transport, Kerala, and attended, inter alia, by the Principal Secretary to the Government of Kerala, Department of Transport, the Transport Commissioner (in-charge), the Road Safety Commissioner, Safe Kerala State Nodal Officer and representatives of KELTRON, was held on 07.08.2019 in this regard at the South Conference Hall, Secretariat, Thiruvananthapuram. The agenda was presentation of Safe Kerala project by KELTRON. KELTRON presented the project in detail regarding its design, implementation and management, explaining as to how road accidents could be reduced effectively by implementing advanced technology based automated enforcement

management systems. KELTRON was asked to submit a revised techno-commercial project. A copy of the Minutes of the meeting held on 07.08.2019 at the South Conference Hall, Secretariat, Thiruvananthapuram and chaired by the Honourable Minister for Transport, Kerala is produced herewith and marked as **ExhibitR1(e)**.

24. KELTRON, in turn, on 22.08.2019, submitted a detailed Project Proposal for Advanced Automated Traffic Enforcement System and Facility Management Services under the Safe Kerala Project to the Motor Vehicles Department through the Transport Commissioner. The same was more or less on the lines of and based on the aforementioned report (dated 21.06.2019) submitted by the Nodal Officer, SAFE Kerala Project to the Transport Commissioner (which report was also directly submitted to the Government in advance with date 17.06.2019). This proposal by KELTRON comprised of AI (Smart) camera systems, setting up of one central control room, capital expenditure for control rooms in 12 districts of the State, providing necessary equipment at control rooms, Radar based speed Enforcement system, and Mobile radar based Speed Violation Detection System (SVDS) with vehicle. It also included Facility Management Service for maintaining the facility and deploying employees in 14control rooms, including the 2 extra control rooms in Thiruvananthapuram and Calicut. The proposal was titled as "Advanced Automated Traffic Enforcement System based on BOOT Model for 5 years and Facility Management Services for 5 Years under SAFE KERALA PROJECT". The features put forward by KELTRON in the project report are a. AI smart camera (incident detection cameras) which are deployed in

city roads use Artificial intelligence (AI) which can help the law enforcement authorities to detect and identify any offence as detailed in the report. These AI based Cameras use state of art deep learning technology to learn and detect various incidents and report the same to the control room. They are also equipped with IR illuminators for night detection.b. The system will analyse camera output and detect violations and incidents like seat belt violation, helmet violation, usage of mobile while driving, triple riding, wrong number plate, lane change etc c. Other components included detection systems for red light violations, fixed speed violations, parking violations and general enforcement system using Automatic Number Plate Recognition (ANPR) cameras etc d. There is software for Control room management and Challan processing etc. The proposal also included thecost of civil works in control rooms, HR cost for personnel from Managers for each control rooms to helper (all outsourced) -- all mentioned as Facility Management System. The KELTRON projected a cash flow of Rs.424 Cr as estimated revenue collection during five years. After deducting the amount to be paid to KELTRON, i.e., Rs.236 Cr, there will be a surplus ofRs.188 Cr, as per their projected cash flow.

25. This proposal could be categorised under two heads, i.e. a. Those electronic items to be set up on roads, in 14control rooms (2 control rooms with only civil infrastructure were already set up) etc including the operation, repair/maintenance by KELTRON for 5 years etc - Rs. 1,68,90,26,124/- (including GST and CESS)b. FMS for five years (66.92 crore) including the outsourced human resource (146 persons for five years), Internet and electricity charges, stationary, printing, postage, despatch of 25 lakh

challans per year etc - Rs.66,92,02,688/- (including GST and CESS)The total cost of the project was estimated by KELTRON as Rs.235.82 Crore (including GST and CESS). Even though KELTRON project proposal was titled as BOOT (Build Own Operate Transfer) project for 5 years, KELTRON had insisted that the entire Rs 235,82,28,812 Crore has to be paid back in 20 equal instalments at the rate ofRs.11,79,11,440/- per quarter in the initial/ original proposal itself in 2019. A copy of the detailed Project Proposal for Advanced Automated Traffic Enforcement System and Facility Management Services under the Safe Kerala Project submitted by KELTRON to the Motor Vehicles Department, Government of Kerala is produced herewith and marked as **Exhibit R1(f)**.

26. The detailed Project Proposal of KELTRON was evaluated by a Six Member Technical Committee of the Motor Vehicles Department on 22.10.2019. Before the said Technical Committee, KELTRON presented the project in detail regarding the design, implementation and facility management services for 5 years on two models; (1) BOOT with quarterly annuity model and (2) CAPEX model with 5 year Facility Management Services. As per the presentation of KELTRON, in the CAPEX model, the Government was to invest all the amount for the infrastructure and for 5 years support. In the BOOT model, no upfront investment by the Government was contemplated. It was specifically stated that the system integrated would take care of all the initial investment and run the system for period of 5 years, with the Government having to release guaranteed payments in each quarter after commissioning of the project. The financial proposals were considered by the Technical Committee. The Committee

considered the financial proposals in the perspective of making upfront payment qua having no such need. The said BOOT Model proposed, that is the BOOT model with quarterly guaranteed payments to the BOOT vendor, was recommended to be suitable. A true copy of the Evaluation Report dated 22.10.2019 of the Technical Committee of the Safe Kerala Project is produced herewith and marked as **Exhibit R1(g)**. The Transport Commissioner forwarded the proposal to the Government.

27. Subsequently, in accordance with G.O. (Rt) No. 559/2019 Transport dated 17.12.2019. Technical Committee comprising of the Principal Secretary, Transport Department as Chairman and Transport Commissioner, Joint Transport Commissioner, Senior Consultant of the Kerala State IT Mission Director, Safe Kerala Project Nodal Officer as members, examined the Project Proposal of KELTRON and approved the same, subject to conditions. A true copy of G.O. (Rt) No. 559/2019 Transport dated 17.12.2019 is produced herewith and marked as **Exhibit R1(h)**.A true copy of the Minutes of Technical Committee meeting held on 28.12.2019 is produced herewith and marked as **Exhibit R1(i)**.

28. On consideration of the detailed Project Proposal for Advanced Automated Traffic Enforcement System and Facility Management Services under the Safe Kerala Project submitted by KELTRON, the Government, as per Exhibit P3 Government Order, granted administrative sanction for implementing the same.

As to whether there was change in the dynamics of implementation of the project or change of module from BOOT to the annuity

29. In the proposal of the Nodal Officer, Safe Kerala Shri. Shibu.K.Itty two models were proposed One CAPEX (outright purchase) and another model prescribed was mentioned not as BOOT but as BOOT-Annuity model with guaranteed quarterly payments for 5 years. Thus it is clear that the project was conceived from day one as a project with quarterly assured payments for 5 years.

30. Exhibit R1(f) detailed Project Proposal for Advanced Automated Traffic Enforcement System And Facility Management Services under the Safe Kerala Project submitted by KELTRON contemplated a commercial proposal of a 5 year BOOT model with payment of 20 equal assured installments on quarterly basis. It was the said detailed project proposal of KELTRON that was evaluated by the 6 member Technical Committee of the Motor Vehicles Department on 22.10.2019.Before the said Technical Committee, KELTRON presented the project in detail regarding the design, implementation and facility management services for 5 years on two models; (1) BOOT with quarterly annuity model and (2) CAPEX model with 5 year Facility Management Services. It is discernible from Exhibit R1(g)Evaluation Report of the Technical Committee that the financial proposals considered by the Committee included the five year BOOT model with quarterly assured payments to the BOOT vendor in 20 installments and the said BOOT model was recommended, in contra-distinction to the CAPEX model.

31. It was the very same detailed project proposal of KELTRON that was considered by the technical committee in terms of exhibit R1 (h) Government Order.

32. As is revealed from Exhibit P3 Government order, administrative sanction was given on consideration of the Advanced Automated Traffic Enforcement System and Facility Management Services under the Safe Kerala Project submitted by KELTRON.

33. Clause 4.c of Exhibit P5 Service Level Agreement and clause 1.11 of Exhibit P6 make it clear that payment will be quarterly in 20 equal instruments.

34. It is most humbly submitted that, from the aforementioned facts and circumstances, it is crystal clear that the project has been implemented as it was originally conceived; that, by BOOT model, what was contemplated was that there was no need for any upfront payment to be made by the State Government; and that there was no change in the dynamics of implementation of the project.

35. In BOOT model, there is no obligation of the State to effect payment for the expenses incurred by the Operator. However, statutory and sovereign functions like issue of challans or the collection of compounded fees cannot be delegated. The project was conceptualised from the very outset in a manner wherein KELTRON could operate only the equipment and the statutory functions were to be exercised by the Government Staff. KELTRON built the project and operate it partially. The amount for the capital investment and facility management has to the paid off after the

project is commissioned in 20 quarterly installments, thereby relieving the Government for the need of any upfront expenses at the beginning. The term BOOT is only a misnomer or has been loosely phrased, just to mean that there was no need for any upfront payment to be made by the State Government.

36. The original project proposal of KELTRON had clearly set forth the payment condition with 5 years BOOT with 20 equal quarterly payments of Rs.11,79,11,440/- (Rupees eleven crore seventy nine lakh eleven thousand four hundred and forty). The total BOOT amount of Capital Expenditure was Rs.1,68,90,26,174/- (Rupees one hundred and sixty eight crores ninety lakh twenty six thousand one hundred and seventy four) (made up of basic price of Rs.1,41,93,49,648/- and GST and Cess at the rate of Rs. 26,96,26,440/-) and Operational Expenditure for Facility Management Services as Rs.66,92,02,688/- (Rupees sixty six crores ninety two lakh two thousand six hundred and eighty eight) (made up of basic price of Rs.56,23,55,200/- along with GST and Cess calculated at Rs. 10,68,47, 488/-). Clause 4(c) of service level agreement dated 05.08.2020 also provides for payment terms as 20 equal quarterly assured payments of Rs.11,79,11,440/- (including applicable tax), Clause 4(d) makes it clear that quarterly payments include facility management service/Operational Expenditure charges also. Thus, it is clear that the State Exchequer has not been directly or indirectly made to part with more than what has been envisaged in the beginning.

As regards how the now adopted BOOT Model with annuity payment by way of 20 quarterly installments was beneficial than the CAPEX Model, necessitating total upfront payment.

37. If this project was implemented in CAPEX model, Government would have to invest all the amount in one go initially for the entire infrastructure, support/facility management etc for Five/Ten Years. As a result a huge amount of cash outflow would have to be met from the exchequer on the day one itself and also in the subsequent years after warrantee period as AMC. But in the adopted model there is no up-front investment by Government. KELTRON will take care of all the initial investment and run system for five years while retaining the ownership with MOTOR VEHICLES DEPARTMENT. Moreover Government need only to release project cost in 20 Quarterly installments and not in lumpsum.

38. KELTRON set up the required infrastructure in place in 650 locations in 2022 itself as seen from the letter number E1/37/2019/TC dated 23.02.2022 of the Transport Commissioner. If government had invested in the CAPEX, it would have remained idle from the year 2020 till 05.06.2023, when it was being set up on the Roads of Kerala and finally commissioned. As per the Service Level Agreement signed by the Transport Commissioner, the quarterly payments start only from "Go live" ie from 5th June 2023 and that too, only for the components which are performing as per requirement.

39. Government would also have to pay for the Annual Maintenance Contract (AMC) charges after the warranty period. If no comprehensive AMC is signed, the cost of replacement of costly components would have to be

borne by government. The Motor Vehicles Department, which consists of mechanical/automobile engineers does not have the expertise for such quality assurance of items procured, or rectification of performance issues of sophisticated electronic components. In Government, procurement of such components, then making it operational etc. is a very time consuming process. All these issues including performance issues are taken care of by the Keltron's proposal of BOOT with ensured quarterly annuity payment.

40. Automated traffic enforcement system was almost fully erected in June 2022 and it was commissioned on 5thJune 2023. If it was purchased by Government under the CAPEX model, by the time it was commissioned, one year out of the warranty period would have elapsed. Here, the Government is not paying anything for the repair, maintenance or upkeep/ensuring performance of the equipments. All these issues are avoided in the present model and the obligation of payment of Government starts only after the project "Go live" and only on the basis of the equipment performing to the satisfaction.

<u>As regards what is Automated Traffic Enforcement system</u>

41. This project is not a mere camera but these are with different kinds of Automated Traffic Enforcement Systems with so many components of devices mainly consisting of.

1. Artificial Intelligence based enforcement system with ANPR Camera comprising latest global shutter technology.
2. Radar based speed enforcement system both mobile and fixed. (SVDS & MSVDS)

3. Red Light Violation Detection System
4. Artificial Intelligence based parking Violation System
5. 12 District Enforcement Control Rooms
6. 1 State Central Control Room with all backend software

42. The capital Expenditure part of the project included implementation and commissioning of one State Central Control Room and 12 out of the 14 District Enforcement Control Rooms, with Ernakulam and Kozhikode District Enforcement Control Rooms which were already in functioning stage. The implementation also included operationalisation of 726 different kinds of automatic day and night traffic enforcement systems and the Operational Expenditure consists of salary and benefits of around 146 technical man power required to run the project for a period of 5 years from the time the project became operational at the State Central Control Room and 12 District Control Rooms, the broadband connectivity charges for 726 enforcement systems, leased line charges, electricity charges for all 14 District Enforcement Control Rooms and State Central Control Room, postal charges for sending challans to violators etc and all connected facility management at the capital infrastructure buildups.

<u>As regards the tender procedures</u>

43. The tender advertisement was made in the leading news papers the Business line (all India edition) on 29-06-2020 and the Mathrubhumi (State Edition) on 28.06.2020. The tender (No.KSEDC/KCC/CPG/ENQ/0041/20-21 dated 26.06.2020) was invited through the e-tender platform of Government. (Four firms) took part in the tender process. One of the bidders did not

qualify in the technical bid evaluation and the said bidder did not make any complaint over its rejection, so far, to the knowledge of the Government. The tender was awarded to the Lowest bidder (L1) and there was no objection raised by other 2 qualified bidders L2, and L3 so far to the knowledge of the Government. No one outside the tender also complained that L1, L2 & L3 and the rejected firm formed a cartel and bid for the tender so far to the knowledge of the Government. In the said circumstances, the allegations, contentions and averments in the writ petition to the effect that there occurred enrooting or channeling of benefits primarily to two entities which had come out through backdoor; that the persons behind the two entities were persons closely associated with those in the corridors of power; that their real presence could be seen, only on lifting the veil; and that there occurred cartel formation to favour the seventh and the nineth respondents to siphon off public funds, have been made without any basis and only to create a cause of action to file this writ petition.

44. The procured instruments are working since 5th June, 2023 and have been successful in detecting the offences so far. The accuracy was certified by a committee constituted by the Government. After the implementation of the advanced traffic enforcement system, the road accidents, fatalities and injuries have come down. In addition, Revenue could be generated through compounding fee.

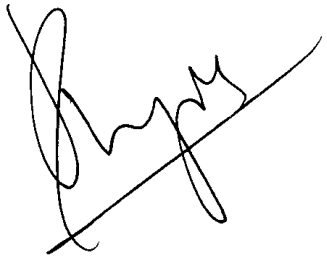
As regards the safety of data collected and the alleged violation of the right to privacy

45. The contractor would not be in possession of all the data, security, configuration and facility arrangement because once the commissioning of the systems is done, they have no further role in that thereafter. The facility arrangement is done by this respondent as per Facility Management Service.

46. The 7th Respondent cannot violate the right to privacy of the citizens because all the data related to the traffic rule violations are securely stored in the servers at the State Central Control room which is under the direct control of the Motor Vehicles Department authorities and technically supported by KELTRON. Neither the 7th Respondent nor any other agency has access to the data. The configuration of the equipment and the facility management service is taken care of by KELTRON alone.

47. According to 'Safe Kerala Project' the authorities for data access is Motor Vehicles Department only. KELTRON will give technical support to Motor Vehicles Department. There is no role for any private company on data access.

48. It is submitted that image of violating vehicle will automatically be captured by the various enforcement camera system. The programming is such that only images of violating vehicles and offers will only be captured and nothing else. The captured image will be send as encrypted data to the servers in the State Central Control Room under the Kerala Motor Vehicles Department.

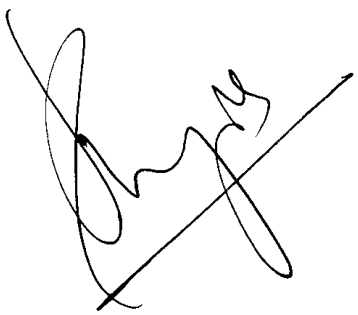


49. The respective district operators access their allotted violation data through VPN and verify the same. It is to be noted that the operator cannot alter or delete the offence data. Valid violations vehicle image, location, time , vehicle registration number details are sent to the ITMS application, which is owned by Ministry Of Road Transport and Highways (MORTH) and is maintained by National Informatics Centre.

50. The designated respective district officers of Motor Vehicles Department once again verify the same through ITMS application and valid violation will be approved.

51. Owners details of the approved violation vehicle is taken by the MORTH's ITMS application from their VAHAN database and the violation information, including the vehicle owner details, is pushed to the MORTH owned E-challan application, which will generate the E-challan for the same. KELTRON's respective district operators download this E-challan, take the print out of same and the same is submitted to Motor Vehicles Department for approval. This approved challan will be send by ordinary post. Using the MORTH's E challan application payment portal, the offender can pay the fine through online. Once they remit the fine, it will be credited to the designated treasury account of the State of Kerala.

52. The Government has requested KELTRON to develop a special grievance redressal mechanism, proposed to be implemented within a time frame, after which public can submit complaints regarding challan through this portal.



53. All the violation images are recorded in the servers in State Central Control Room which is under the control of Motor Vehicles Department, Government of Kerala and Challan information are in NIC servers which is under the control of the Central Government. Therefore, there arises no question of data leakage or data transfer to private servers through the Safe Kerala scheme.

54. All the enforcement systems are securely connected using 128 bit encryption, to the State Central Control Room with a Datacenter installed at the Office of the Regional Transport Officer (Enforcement), Thiruvananthapuram. The connectivity between Enforcement systems and Control room is done using IOT sim cards which are programmed to communicate only with the Static IPs of the Datacenter. Access to devices at sites can only be done by personnel having valid software certificate. Only pre-authorized Laptop with known credentials can log into the system for maintenance purposes. This software certificate will not work in another laptop. Access to the Field device is limited to maintenance purpose only. Access to data is not possible for the field maintenance staff. Physical entry to the data centre is restricted using a secure access control device with only fingerprint or facial recognition authorization. The security of the Datacenter is managed using high-end Firewall devices from Checkpoint by a team of System Administrators and Managers. The connectivity to the Central Control Room is restricted to 14 district control rooms using secure VPNs created using firewall devices and Static IP's. The applications used for verification of violations can be accessed only through a specific set of IPs provided in the VPN. Internet will not be accessible on these IPs.

55. Thus, the personal data of individuals are well protected in the system. The servers are in the custody of the Motor Vehicles Department and the entry to the server room is controlled by bio metric access control. The data is encrypted and access to the servers are limited to authorised departmental officers through firewalls. Government is also planning to issue instructions to Transport Commissioner to get the system audited by a security certification agency like STQCs

As to whether there was realistic or factual basis for the fine collection projected by KELTRON.

56. The Transport Commissioner, while forwarding the Safe Kerala proposal in 2019, mentioned that the compounding fee collection was increased from Rs.40.5 Crore in 2011-12 to Rs. 56.43 Crore, when 17 enforcement squads were deployed and from Rs. 81.55 Crore in 2014 – 15 to Rs.86.24 Crore 2016-17 when 34 enforcement squads were deployed. The Transport Commissioner projected the compounding fee collection anticipated when the "Safe Kerala" project is implemented as Over Rs.300 Cr.

57. KELTRON in their proposal has given estimate for collection of Rs 424 crore as fine as follows.

Realisation of fine for the year	**Amount of fine (Rs in crore)**
First	156 (assuming 60% fine amount realisation)
Second	109 (30% less violation than the previous year)
Third	87 (20% less violation than the previous year)
Fourth	70 (20% less violation than the previous year)

Fifth	56 (20% less violation than the previous year
Total	**424 crore**

58. The Government also verified the data as per budget wing on the collection of compounding fee under receipt head of account 0041 – 00 – 102 – 97 as follows.

Year	**Amount in Rs. Cr**
2014-15	157.20
2015-16	165.73
2016-17	182.23
2017-18	186.59
2018-19	171.45
2019-20 till February	170.37

59. Hence the estimation of Rs 424 crore as collection of compounding fee cannot be considered as without any base at all.

Accident Comparison before and after the implementation of Artificial Intelligence Cameras under the Safe Kerala Project.

60. The Artificial Intelligence Cameras installed under the Safe Kerala Project started functioning with 05/06/2023. With the implementation of the above Camera Systems the number of fatalities on account of road accidents are on the decline when compared with that 2022. The number of fatalities got reduced from 344 in June, 2022 to 276 in June, 2023; from 313 in July, 2022 to 264 in July, 2023; and from 307 in August, 2022 to 58 in August, 2023 (as per State Crime Records bureau data updated on 05.09.2023). A comparative figure of the road accidents that occurred in August, 2022 and

August 2023 and resultant fatalities and injuries (as per State Crime Records bureau data updated on 05.09.2023) is given below:

No: Accidents		No: of Fatalities		No: of Injuries	
August 2022	August 2023	August 2022	During 2023	During 2022	During 2023
3366	1065	307	58	4040	1197

Details of Challans generated from AI Cameras till 05/09/2023

Description	Count
Notice pushed to Intelligent Traffic Enforcement Management System	10, 42, 154
Total e-Challan generated	9, 24, 357
Total e-Challans pending for approval from Motor Vehicles Department	1, 17, 797
Total Challans sent by post	7, 14, 330
Total Compounding Fee imposed	Rs 59,72,03,500/-
Total Compounding Fee collected	Rs. 7, 62, 71, 250/-

As regards the contentions based on file notings

61. The contentions, averments and allegations to the effect that the objections of the Finance Department was withdrawn or swallowed and the proposal of the Transport Commissioner was concurred with by the Department on 22.05.2018; that what influence prevailed upon the Department to suddenly approve a proposal which it objected for overlapping with existing schemes, which would be a huge financial liability and was routed violating all

procedure; that the demand for a detailed work study was also magically dropped; that it was therefore clear and evident that the "Safe Kerala" project had the blessings of some powerful source from the very beginning which had the authority and influence to silence, all objections with a single swipe of the hand; that this will cast shadow in the bonafides of the project proposal since all such corrupt concepts are introduced with sugar-coating; and that the Finance Department's efforts to save public money was blocked, are wrong and hence denied.

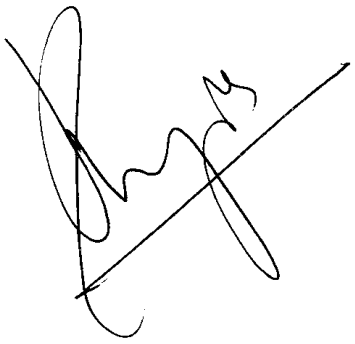
62. The Finance Department never remarked that the project should be rejected. The Finance Department in the Government did not object to the awarding of the project to KELTRON at any point of time. On the contrary, the Finance Department in the Government considered it is an attractive project of Motor Vehicles Department in improving the traffic safety. The Finance Department raised certain queries which were clarified by KELTRON through the Transport Commissioner. Finally the Finance Department agreed to the proposal subject, inter alia, to approval by the Council of Ministers on its earlier comments. The administrative sanction in the first instance and comprehensive sanction in the final instance was issued by the Transport Department after getting concurrence from the Finance Department. The objections raised by various officials at various stages in the various Departments of the Government shows that the pros and cons of the proposal submitted by KELTRON was evaluated thoroughly.

63. A noting recorded in the file is merely a noting simpliciter and nothing more. It merely represents expression of opinion by the particular official.

By no stretch of imagination, such noting can be treated as a decision of the Government. Even if the competent authority records its opinion in the file on the merits of the matter under consideration, the same cannot be termed as a decision of the Government unless it is sanctified and acted upon by issuing an order in accordance with Articles 77(1) and (2) or Articles 166(1) and (2). The noting in the file or even a decision gets culminated into an order affecting right of the parties only when it is expressed in the name of the President or the Governor, as the case may be, and authenticated in the manner provided in Article 77(2) or Article 166(2). A noting or even a decision recorded in the file can always be reviewed/reversed/overruled or overturned and the court cannot take cognizance of the earlier noting or decision for exercise of the power of judicial review.

64. The notings and/or decisions recorded in the file do not confer any right or adversely affect the right of any person and the same can neither be challenged in a court nor made basis for seeking relief. Even if the competent authority records a noting in the file, which indicates that some decision has been taken by the authority concerned, the same can always be reviewed by the same authority or reversed or overturned or overruled by higher functionary/authority in the Government.

65. In the aforementioned fact situation and in light of the settled law on the point, the reliance placed upon by the petitioner on file noting, that too randomly picked up from here and there, and the averments, allegations and contentions built upon the same are not sustainable.



As regards Exhibit P27 Government Order

66. The averments, allegations and contentions to the effect that as per Exhibit P27 order, all the illegalities starting from the totally unrealistic cost estimate, the namesake BOOT model, the lack of approvals of the Finance Department for the same, the bar for KELTRON to act as PMC etc were all swept under the carpet and given a stamp of approval, are wrong and hence denied. The further contention to the effect that the Council of Ministers, instead of taking decisions on the questions/subjects posed in Exhibit P25 note, in a one liner decision, and without any deliberations, approve the same, is against all settled principles of administrative law.

67. The fifth respondent Transport Commissioner, as resolved in the State Level Executive Committee of the Kerala Road Safety Authority, requested the Government for a comprehensive administrative sanction with regard to Safe Kerala Project. All the Components implemented under the Safe Kerala Project had already received individual Administrative Sanction. However, the Safe Kerala Project, as a whole did not have an Administrative Sanction and, therefore, steps were taken to obtain a Comprehensive Administrative Sanction.

68. It was reported by the fifth respondent Transport Commissioner, in the course of communications with the Government, that KELTRON had informed that the implementation of Safe Kerala Project involve intellectual properties like systems design, concept utilization, preparation of specifications, various installation drawings prepared after the detailed survey in all the 14 districts of Kerala covering 726 locations and design of

14 district control rooms and State Control Room; that those activities needed the involvement of full Technical team, Purchase & Accounts personnel of M/s KELTRON; that amounts had been spent upfront towards manpower cost, documentation and facility implementation for assembly and testing camera module; and that M/s KELTRON had informed that due to delay in "GO LIVE" of the project, they had spent approximately 50 lakhs, since April 2022 towards connectivity charges for camera system, leased line connectivity charges for control rooms, salaries for the staffs, etc.

69. As regards the contention to the effect that the Finance Department, under political pressure, buckled from its earlier stand that the BOOT model of procurement was never concurred by it and that the entering of service level agreement between Motor Vehicles Department and KELTRON was violative of stipulations in Exhibit P22 G.O, it is most humbly submitted that the Finance Department agreed to the proposal, subject to securing the decision of the Council of Ministers, on the structure of the project and deviation from its comments made earlier in the course of further intimation by the fifth respondent Transport Commissioner that there happened no deviation from the Government Orders giving approval to the project at various stages. It was also reported by the fifth respondent Transport Commissioner that Service Level Agreement executed between Motor Vehicles Department and M/s KELTRON was in accordance with para-4 of Exhibit P22 G.O and that the tripartite Agreement shall not be applicable in this Project, since the same was executed as BOOT model and the entire payment not being released soon after the completion of the Project; and

that M/s.KELTRON had entered into an Agreement with the Bidder covering all the major conditions in the Agreement between Motor Vehicles department and M/s.KELTRON.

70. In paragraph 10 of Exhibit P22 G.O, it was noted that the terms of the service level agreement, payment by way of 20 quarterly installments were contemplated and therefore it was not to be termed as a conventional BOOT model. In this aspect it may have to be noted that the project was envisaged, approved and implemented that the mode of payment as quarterly payments panning over a period of 5 years by way of 20 installments. The term BOOT was only a misnomer or has been loosely phrased, just to mean that there was no need for any upfront payment to be made by the State Government. The said misnomer was corrected in Exhibit P27 Government Order.

71. Government had cleared the proposal directing KELTRON to act as Project Management Consultant (PMC) and to select a vendor through a transparent bidding process. Only for the hardware part, KELTRON had acted as a PMC. It was not a PMC for several other components including Facility Management Services. G.O. (P) No 118/2018/Fin dated 3.8.2018 prescribed guidelines for engaging a PMC. The project in question is a unique project which cannot be construed as procurement of components alone. It consists of design of the project, assembly and fabrication of the procured items to make it a fully automated road safety enforcement system, and ensuring that the integrated systems perform well during the operation period. The cost submitted by KELTRON also included survey of sites where 726

gantries/poles were to be erected, cost of Facility Management Services - i.e. cost of refurbishing of control rooms, salary of outsourced human resources, purchase of vehicles, running of vehicles including diesel and their maintenance, internet/ electricity charges, printing and posting of challans, etc.The file was examined at Government with reference to the existing Government orders prescribing the role of PMC.

72. When the Transport Commissioner requested for a comprehensive sanction, the matter was examined by the Government again and several queries were raised. Several documents were obtained from KELTRON and forwarded for the examination by the Transport Commissioner. KELTRON had acted as a PMC for items procured from outside and also undertaken a tender process in accordance with Exhibit P3Government Order KELTRON has claimed the PMC charges only for the activities of tender for the main tender and not for other tenders or for Facility Management Services. In this regard, there was no violation of any statutory provision. If at all there was any deviation, the same was with regard to guidelines of a Government Order. The Government had prescribed the guidelines and the Government is fully competent to ratify the deviations, if any, from the existing guidelines made by a Public Sector Undertaking. It is trite and settled law that ratification relates back to the original order.

73. Thereafter, matters noted for consideration of the Council of Ministers was, after due deliberations, approved by the Council of Ministers. The Council of Ministers first considered the note for comprehensive sanction on 05.04.2023 and directed to obtain remarks of the Departments of Home and

Taxes and cleared the same on 12.04.2023. It is most humbly submitted that as to whether there were deliberations in the Council of Ministers is not justiciable. It is most humbly submitted that being an administrative decision, the concurrence or otherwise on the matters noted for consideration need be noted. The contentions to the contrary are not sustainable. Consequently, Exhibit P27 Government Order was issued.

74. The project was implemented with due deliberations at various levels over a period of 6 years. It started with a project proposal initiated by one of the officers in 2017, based on the experience of "Safe Zone Project of Sabarimala". The Government accorded sanction to the proposal to scale it up to the whole of Kerala. The original proposal was revised several times on the basis of the remarks during examination and finally a very detailed technology oriented project was proposed by KELTRON. The Government, after due diligence, cleared the project. In the original Exhibit R1(f) proposal submitted by KELTRON, the capital expenditure with taxes were to add to Rs.1,68,90,26,124/-, the operational expenditure for 5 years were to add to Rs.66,92,02,688/-, and the proposed total expenditure was Rs.2,35,82,28,812/-. After negotiations by the Additional Chief Secretary, Department of Finance, Government of Kerala, with KELTRON, the amount for capital expenditure was reduced to Rs.165,89,71,150/- and the final amount was reduced to Rs. 232,25,50,286/-. The systems put in place by KELTRON is functioning well so far and serving the intended purpose. It has helped in reducing the accidents, fatalities and injuries - which was the primary objective of the project. The generation of revenue even though a secondary objective, is also being fulfilled.

75. The Writ Petition is devoid of merit and the same is liable to be dismissed. The petitioners are not entitled for any of the reliefs sought for.

All the facts stated above are true to the best of my knowledge, information and belief.

Dated this the 6th day of September, 2023.

DEPONENT

Solemnly affirmed and signed before me by the deponent whom I know, on this the 6th day of September, 2023 at the Government Secretariat, Thiruvananthapuram.

TRANSPORT DEPARTMENT GOVT. SECRETARIAT

LIPU S. LAWRENCE KAS
PEN: 702578
Under Secretary to Government
Transport Department
Govt. Secretariat. Thiruvananthapuram
Phone: 0471 **2518713**

കേരള സർക്കാർ
സംഗ്രഹം

27 NOV 2015

ഗതാഗത വകുപ്പ് - ശ്രീ. പി.ഡി. സുനിൽ ബാബുവിനെ കേരള റോഡ് സുരക്ഷാ അതോറിറ്റിയിൽ ട്രാഫിക് സേഫ്റ്റി എക്സ്പേർട്ടായി നിയമിച്ച് ഉത്തരവാകുന്നു.

ഗതാഗത (ഡി) വകുപ്പ്

സ.ഉ.(കൈ).നമ്പർ. 76/2015/ഗതാ. തിരുവനന്തപുരം, തീയതി, 21.11.2015.

പരാമർശം: 1. സഉ(കൈ) നം. 90/2010/ഗതാ തീയതി 28.12.2010
2. സഉ(കൈ) നം. 84/2013/ഗതാ തീയതി 27.08.2013
3. റോഡ് സുരക്ഷാ കമ്മിഷണറുടെ 10.06.2015, 26.08.2015, 24.08.2015 തീയതികളിലെ എ1/13758/കെ.ആർ.എസ്.എ/2009 നമ്പർ കത്ത്
4. ഗതാഗത കമ്മിഷണറുടെ 18.08.2015 തീയതികളിലെ ഡി3/16914/എസ്റ്റി.എ/2006 നമ്പർ കത്ത്.

ഉത്തരവ്

കേരള റോഡ് സുരക്ഷാ അതോറിറ്റിയിൽ ഒരു ട്രാഫിക് സേഫ്റ്റി എക്സ്പെർട്ട് തസ്തിക സൃഷ്ടിച്ചും പ്രസ്തുത തസ്തികയിലേക്കുള്ള നിയമന രീതിയും വിദ്യാഭ്യാസ യോഗ്യതകളും നിശ്ചയിച്ചും പരാമർശം ഒന്നും രണ്ടും പ്രകാരം ഉത്തരവായിരുന്നു.

ട്രാഫിക് സേഫ്റ്റി എക്സ്പേർട്ട് തസ്തികയിലേക്ക് നിയമനത്തിന് അപേക്ഷ ക്ഷണിച്ചുവെങ്കിലും നിശ്ചിത യോഗ്യതയുള്ള ഉദ്യോഗാർത്ഥികളെ ലഭിക്കാത്ത സാഹചര്യത്തിൽ റോഡ് സുരക്ഷാ മേഖലയിലെ പ്രവർത്തി പരിചയം കണക്കിലെടുത്തും നിലവിലുള്ള യോഗ്യതകളിൽ ഇളവുവരുത്തിയും മോട്ടോർ വാഹന വകുപ്പിൽ നിന്നും റീജിയണൽ ട്രാൻസ്പോർട്ട് ഓഫീസർ (എൻഫോഴ്സ്മെന്റ്) തസ്തികയിൽ നിന്നും വിരമിച്ച ശ്രീ. പി.ഡി. സുനിൽ ബാബുവിനെ ട്രാഫിക് സേഫ്റ്റി എക്സ്പേർട്ടായി കരാർ അടിസ്ഥാനത്തിൽ നിയമിച്ച് ഉത്തരവാകണമെന്ന് പരാമർശം മൂന്ന് പ്രകാരം റോഡു സുരക്ഷാ കമ്മിഷണർ അഭ്യർത്ഥിച്ചിരുന്നു.

സർക്കാർ ഇക്കാര്യം വിശദമായി പരിശോധിച്ചു. കേരള റോഡ് സുരക്ഷാ അതോറിറ്റിയിൽ ട്രാഫിക് സേഫ്റ്റി എക്സ്പേർട്ട് തസ്തികയിൽ നിയമനത്തിന് നിശ്ചിത യോഗ്യതയുള്ള ഉദ്യോഗാർത്ഥികളുടെ അഭാവത്തിൽ റോഡ് സുരക്ഷാ മേഖലയിലെ പ്രവർത്തി പരിചയം കണക്കിലെടുത്തും റോഡു സുരക്ഷാ പ്രവൃത്തികൾ അടിയന്തിര പ്രാധാന്യം അർഹിക്കുന്നതിനാലും നിലവിൽ നിശ്ചയിച്ചിട്ടുള്ള യോഗ്യതാമാനദണ്ഡങ്ങളിൽ ഇളവുവരുത്തിയും മോട്ടോർ വാഹന വകുപ്പിലെ റീജിയണൽ ട്രാൻസ്പോർട്ട് ഓഫീസർ (എൻഫോഴ്സ്മെന്റ്) തസ്തികയിൽ നിന്നും വിരമിച്ച ശ്രീ. പി.ഡി. സുനിൽ ബാബുവിനെ കേരള റോഡ് സുരക്ഷാ

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അതോറിറ്റിയിൽ ട്രാഫിക് സേഫ്റ്റി എക്സ്പേർട്ടായി കരാർ അടിസ്ഥാനത്തിൽ ഒരു വർഷത്തേക്ക് നിയമിച്ച് ഉത്തരവാകുന്നു. ടിയാന്റെ വേതന വ്യവസ്ഥകൾ സംബന്ധിച്ച് ഉള്ള ഉത്തരവ് പിന്നാലെ പുറപ്പെടുവിക്കുന്നതാണ്.

ഗവർണ്ണറുടെ ഉത്തരവിൻ പ്രകാരം
ജിജി തോംസൺ
ചീഫ് സെക്രട്ടറി

റോഡ് സുരക്ഷാ കമ്മീഷണർ, കേരള റോഡ് സുരക്ഷാ അതോറിറ്റി, തിരുവനന്തപുരം.
ഗതാഗത കമ്മീഷണർ, തിരുവനന്തപുരം.
സംസ്ഥാന പോലീസ് മേധാവി, തിരുവനന്തപുരം.
ശ്രീ. പി.ഡി. സുനിൽ ബാബു (റോഡ് സുരക്ഷാ കമ്മീഷണർ മുഖേന)
ജില്ലാ കളക്ടർ, തിരുവനന്തപുരം.
ഡയറക്ടർ, നാറ്റ്പാക്ക്, തിരുവനന്തപുരം
അക്കൗണ്ടന്റ് ജനറൽ (എ&ഇ), (ആഡിറ്റ്) കേരള, തിരുവനന്തപുരം
വെബ് ആന്റ് ന്യൂമീഡിയാ വിഭാഗം, വിവര പൊതുജന സമ്പർക്ക വകുപ്പ്
(ഉത്തരവിന്റെ പകർപ്പ് വെബ്സൈറ്റിൽ അപ്ലോഡ് ചെയ്യുന്നതിനായി)
ഡയറക്ടർ, വിവര പൊതുജന സമ്പർക്ക വകുപ്പ്.
അഡിഷണൽ സെക്രട്ടറി ടു ചീഫ് സെക്രട്ടറി
പൊതുഭരണ (എസ്.സി) വകുപ്പ്
(07.10.2015 തീയതിയിലെ 7587 നമ്പർ മന്ത്രിസഭാ യോഗ തീരുമാന പ്രകാരം)
ആഭ്യന്തര വകുപ്പ്
പൊതുമരാമത്ത് വകുപ്പ്
ഗതാഗത (എ),(ബി),(സി) വകുപ്പ്
കാര്യാലയ ഫയൽ, ഓഫീസ് കോപ്പി.

ഉത്തരവിൻ പ്രകാരം

GOVERNMENT OF KERALA

Extract

Motor Vehicles Department- Orders are hereby passed appointing Sri.P.D Sunil Babu as Traffic Safety Expert in the Kerala Road Safety

Motor Vehicles(D) Department

G.O(Ms)No 767/2015/MVD. Thiruvananthapuram Dated 21.11.2015

Reference: 1. G.O (M) 90/2010/ MVD Dated 28.12.2010

2.G.O(Ms)No84/2013/ MVD Dated 27.08.2013

3. Letter No. A1/13758 /K.R.S.A/2005 issued by Road Safety Commissioner dated 10.06.2015, 26.08.2015, 24.08.2015 .

4. Letter No. D3/ 16914/ S.T.A/2005 issued by Motor Vehicle Commissioner dated 18.08.2015 .

ORDER

Orders were issued as per reference cited as Item No 1 and 2 wherein a post of Traffic safety Expert was created and the qualification to be appointed to the post of a Traffic safety Expert was fixed in the Kerala Road Safety Authority.

Though application was invited from qualified hands to be appointed as Traffic Safety expert no applicant was available having the required qualification. In that circumstance it was decided to appoint Sri. P.D Sunil Babu as Traffic Safety Expert on contract basis who retired from service as Regional Transport Officer (Enforcement) in the Motor Vehicles Department by taking into consideration his experience in the safety zone and by relaxing the required qualification as requested by the Road Safety Commissioner.

The Government has considered the matter in detail. Orders are hereby passed to appoint Sri. P.D Sunil Babu who has retired from service as Regional Transport Officer (Enforcement) in the Motor Vehicles Department by taking into consideration his experience in the Road Safety Zone as Traffic Safety Expert in the Kerala Road Safety Authority on contract basis for a period of one year by relaxing the guidelines and required qualification to be appointed as Traffic Safety Expert since the road safety is considered as a most urgent and important matter since there was no qualified hands possessing the required qualification

As per the order of the Governor

Jiji Thomson

Chief Secretary

Road Safety Commissioner, Kerala Road Safety Authority, Thiruvananthapuram.

Motor Vehicle Commissioner, Thiruvananthapuram.

State Police Chief, Thiruvananthapuram.

Sri.P.D Sunil Babu (Through the Commissioner, Road Safety)

District Collector, Thiruvananthapuram.

Director, NATPAK, Thiruvananthapuram.

Accountant General (A&E) , Audit, Kerala, Thiruvananthapuram.

Web & New Media Wing,

For the purpose of uploading the copy of the order in the website.

Director, Public Information Department

Additional Secretary to Chief Secretary

General Administration (S.C) Department

(As per the Resolution No 7587 of the meeting convened by the Ministers on 7.10.2015)

Home Department

Public Works Department

Motor Vehicles (A),(B), (C) Departments

Stock File/ Office Copy

645 Ext. R.(b)

A DETAILED PROJECT REPORT ON ROAD SAFETY TO REDUCE THE ROAD ACCIDENTS IN THE STATE OF KERALA

Sub : MVs –Department - Safe Kerala - Detailed Project Report to Reduce The Traffic Accidents in The State of Kerala

Ref:
1. Letter .No. 34/CORS/2014 Dtd. 14th September 2016,04-01-17 and 10-01-2017
2. Letter No.16/2016 CORS Dtd.24th November 2016
3. Letter No.05/ CORS/2016 Dtd. 24th October 2016
4. Letter No.2/2017/CORS/Dtd. 30th January 2017,30-01-2017 and 31-01-2017
5. Letter No.56/2015/CORS Dtd. 27th December 2016 and 20-03-2017
6. Letter No. p16/2016/ CORS Dtd 11th April 2017
7. Letter NO. C2/1286/TC/2013 Dtd. 14.06.2016
8. Letter No.9120/C1/2013 Transport Commiossionarate dtd. 25.06.2016
9. Letter No.180/A1/KRSA/2016 Dtd. 24.03.2017

As per the above references especially on the directions of Hon'ble Supreme Court Committee on Road Safety, the Government have directed The Transport Commissioner Kerala, to initiate some significant and result oriented steps in the field of Road safety in order to minimize the number of Road Accidents and fatalities on roads. In this context, The Special offieer , Safe Zone Project, Sabarimala is entrusted to prepare a Detailed Project Report to reduce the accidents vide reference No. 09.

A detailed study conducted regarding the present conditions of roads, traffic, other transport facilities, road infrastructure, vehicles population, accidents, fatalities, traffic violations, climatic conditions, the staff strength, infrastructure facilities etc. of the Leading and Stake Holding Departments in the State.

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INTRODUCTION

Kerala is a beautiful state on the southern tip of the Indian Subcontinent. Its landscape is 650km in length and between 30 to 80km in breadth. Situated between the Arabian Sea to the west and the Western Ghats to the east, Kerala experiences equatorial tropic climate influenced by the heavy rains brought up by monsoon.

The state is blessed with natural fresh water availability. Its population is highly literate (near-total literacy) with a good knowledge of English language. Needless to say, Kerala enjoys a unique advantage socially and geographically. Administrators with integrity and commitment can make use of the enormous possibilities it presents, in order to create a promising future for Kerala.

For such development of the state, suitable infrastructure is primordial. And with it, fast and secure transport is essential too. Luckily for Kerala, its landscape provides ample opportunities for road, rail, air and water transport. If these opportunities are carefully planned, developed and regulated, Kerala will not be far from being a paradise - a world-class state. This of course, requires detailed study and efficient implementation. Besides, the people of Kerala should also be made aware of the need for civic sense, and a constructive mindset for following the rules. Gladly, Kerala is already way ahead of other Indian states in terms of literacy and motor transport laws.

However Kerala has a higher number of accidents, related deaths and injuries annually. It is also important to note that for the development of tourism (which is important for our economy) too, excellent transport and hotel infrastructure is essential. And infrastructure development must go hand in hand with the ability to reduce accidents, allowing safe transport 24/7.

Kerala being a consumer state, it's important to bring in food supplies and other commodities for its population of about 3.5 crore. Again, since we are not a big state, it's important to provide and use the transport infrastructure to the maximum possible extent day and night. These facts imply that transport safety must be placed even above industrial safety in the list of priorities.

On an average, there are about 39455 road accidents in Kerala last year which result in over 4171 deaths and 44250 injuries. In the last 4 years alone, there have

646 3

been 150043 accidents in Kerala that caused 16338 deaths and seriously injured 57196 people. and 110856 people suffered minor injuries. Compare this to the "safe zone" program conducted by the Kerala Motor Vehicle Department and Kerala Road Safety Authority in Sabarimala during 2016-17 - the pilgrim vehicles that travelled long distances to Sabarimala met with 229 accidents (minor and major) which resulted in 5 deaths and 31 injuries. Beyond significantly reducing road accidents, related injuries and loss of life within its mandated limit of 400 km, the "safe zone" program has covered a distance of 420000 km in patrolling, repaired 6411 vehicles in forest areas and recovered the 229 vehicles involved in accidents. Further, all the injured were swiftly transferred to hospitals including the Kottayam Medical College within "golden hours". These activities also resulted in traffic blocks being quickly removed. It is also to be noted that during the Sabarimala pilgrimage season (November 16th, 2016 to January 20th, 2017), the Kerala Motor Vehicle Department had to regulate an additional 80 lakh pilgrim vehicles (over and above the normal traffic).

From the above figures, it is clear that there is a significant reduction in accidents where the "safe zone" operated, compared to the average amount of accidents in Kerala for the comparable period. It follows that if the patrolling, monitoring, enforcement and rescue operation conducted as part of the "safe zone" program during Sabarimala pilgrimage is extended to the whole state of Kerala, immediate and valuable results can be obtained.

ROAD SAFETY VISION KERALA - A SUMMARY

Among Indian states, Kerala had recorded higher road accident rate for the past five decades. Kerala had registered 1528 road accidents in 1960 which nearly doubled to 2871 in 1965. Further it almost doubled to 5639 accidents in 1975. This increasing trend continued till 1955 when it reached a staggering figure of 30,086 accidents. The State had recorded an all- time high of 41, 678 accidents and 51,225 injuries in 2005. However, the fatalities remained at a lower figure of 3200 persons in 2005.

Until 2005, the number of accidents per thousand vechicles in the State remained as one of the highest compared to the National average. Government of Kerala was deeply concerned over this increasing trend of accidents and the

causalities. The formation of Kerala Road Safety Authority (KRSA) in 2007 was an important step in this direction. Since then, the State Government took several initiatives in the areas of road develpoment, black spot improvement, traffic education and road safety awareness programmes. The authority has been taking several actions to arrest the increasing trend of road accident in the state. The concerted efforts of Police and Motor Vechicle Department in terms sustained enforcement of helmet and seat belt use, speed regulations, traffic surveillance system, observance of lane discipline, check on drunken driving, over-speeding and over loading etc. have yielded desired results.

The state experienced a decline in the absolute number of accidents since 2007. The number of accidents declined from 41,645 in 2006 to 35,013 in the year 2010. It implies that a reduction of 17 percent of accidents during the period between 2005 and 2010. The number of accidents and injuries were 35,028 and 39,999 respectively in 2013 which remained more or less the same as that of previous year. However the Government is deeply concerned about the increasing number of fatalities and casualties especially to the vulnerable road users consisting of pedestrians, two wheeler users, senior citizens and people with varying disabilities.

The Government also recognize that road safety need to be improved upon to the level of developed nations by undertaking all tangible actions. The Government considers road safety as a major public health and economic issue which adversely affects the cross section of the society and vulnerable road users. The Government of Kerala further recognizes that road safety has to be addressed in a holistic manner by providing safer roads, proper training of drivers, effective vechicle management and sustained traffic enforcement.

Keeping in mind the Government's priority on the Road Safety and UN General Assembly Resolution proclaiming 2011-20 as a Decade of Road Safety, the Government of Kerala has come out with this Road Safety Vision Document.

647

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This project is designed with a vision to Regulate and shape a modern integrated transport system to meet the safe and speedy uninterrupted mobility needs of all Keralites and Tourists by 2020.

ROAD SAFETY MISSION

The mission of the Government in transportation sector is for making continuous efforts with long team objective in mind for achieving safe economic and fast transport system for moving people and goods in the state by integrating different modes of Public transports, road, rail, water, air, according to their economic and geographical advantages with respect to cost, speed, low carbon emission and travel comforts. Considering the above facts we have to regulate, enforce monitor and control the integrated traffic system utilizing all modern aminities and well trained man power.

This is an important inevitable project, from the part of Government, for controlling regulating, Safety providing, Confidence creating, Implementing enforcing low and order and co-coordinating the integrated transport system and other departments with proper communication system. The initial expenditure will be little more, But from the first functioning day onwards generating income as comp fee.

Hence this is a very good and necessary project and activity for Kerala State – will create a unique position in global level.

Strategies for Minimizing Accidents and Smooth Regular Transportation.

1. Revamp public transportation systems to increase the share from existing 33% of total passenger traffic to 80% in 2025.
2. Reduce the dependency on private transport to less those 20% of total passenger traffic by 2025.
3. Introduce Mass Rapid Transits Systems (MRTS) for urban commuters.
4. Develop provide 4 and 6 lane ring roads and intercity roads on elevated tracks.
5. Recognize and regulate public transport services such as Auto's, Taxis, Minibuses etc. for connectivity.

6. Arrest the trend for sharp rise in private vehicle ownership and institute travels demand management measures such as vehicle ownership controls (Vehicle Quota System) and vehicle usage controls by 2025
7. Provide and ensure high quality service for the rail, road and water transportation.
8. Facilitate track terminals outside the cities for quicker turn around time to help and reduce traffic congestion.
9. Switch over to CNG/LNG/LPG, solar and electric motive power for public and private vehicles for minimising pollution.
10. Promote road safety and minimize fatalities to zero level.

TARGETS TO BE ACHIEVED

To reduce traffic accidents to 50% of the current level by 2020 and to maintain zero growth level further

To ensure zero accidents at railway level crossings in the state by mannig all unmanned levle crossings and upgrade them to manned level crossings and rail over bridges by 2020

To reduce the severity of road accidents by enforcing the seat belt and helmet use, and strict compliance of speed governors by heavy vehicles.

To minimise loss of lives due to delay in evacuation and transfer road accident victims to first-aid/ trauma care centers and ensure quality medical attention within the minimum response time, say 30 minutes.

To educate road users through various means about the basic road rules.

To impart training to drivers the importance of defensive driving, courtesy and respect to fellow drivers / road users

To constitute a Research Institution in the state for R&D support on Road Safety Action Plan involving Four E, s namely : Engineering, Education, Enforcement, Emergency Response System suitable to Kerala conditions and also prepare accident analysis reports, data base management, investigation of causative factors and accident reconstruction methods. Chakkuvallichira, Kunnathor, on the side

648 7

of N.H. 183- Kollam-Theny National High way is an apt place for the above Institution. Government land is available at chakkuvalli for the above purpose.

REALAISATION OF TARGET

The following are the tasks identified to realise the above targets:

- Establishment of necessary infrastructure to carry out routine accident investigations and conduct safety audit of highways, identify stretches having defective road geometrics, lack of road-side appurtenances and safety devices
- Strict enforcement against all traffic violations using intelligent transport system such as radar speed check devices, surveillance cameras, GPS/GIS enabled accident management system by 24x7 patrolling.
- Compulsory Inspection & Certification of transport vehicles every year including safety and emission norms and link registration/insurance of vehicles with Inspection & Certification.
- Establishing post-accident trauma care facilities desirably at 10 km. radius on National and State Highways and ensuring medical care to accident victims within minimum response time (say 20 to 30 minutes)
- Encouraging private sector participation in rescue, evacuation and trauma care of accident victims for effective of emergency relief services.
- Encouraging NGOs and other expert agencies in spreading raod safety messages and conduct road safety awareness compaign to educate public on defensive driving and safe journey.
- Setting standards for safe design of roads by providing speed reduction devices, traffic sign boards, signals, pedestrian facilities and adequate parking supply.
- Improve sight distances at curves and junctions by removing all obstructions such as structures, trees, compound walls etc. and by enacting necessary land use control legislation
- Introduction of activity based traffic education in school curriculum.
- Soft policing on first time traffic violators and educating them the type of violation and its impact of other road users.

- Hard policing and strict enforcement on habitual traffic violators with the help of ITS technologies such as surveillance cameras, interceptors and other advanced automated traffic control devices. Strategies should be evolved for sustained enforcement on over speed, rash driving , non-wearing of seat belt and helmet, using mobile phone while driving and other traffic rule violations.
- Improve the quality of accident data-base for R&D purposes and decision support system.
- Equip the motor Vehicle Department as the Lead agency for dealing with all matters of motor vehicles and Road Safety, enforcement evaluation of their fitness, issuing/renewal of driving licenses and other permits on most scientific and efficient way, comparable to world standards with out delay.
- Strengthening of Kerala Road Safety Authority with adequate technical man-power, capacity building and research functions to provide an institutional framework for a coordinated approach to prevent road accidents.

POLICY VISION FOR ZERO TOLERANCE

The World Health Organisation slogan, " Road Safety is No Accident" actually means zero tolerance of all causes/factors of accidents. Such an approach of zero tolerance is base on the following principles:

i. Priority- Human life and health are paramount, and safety consideration should take priority over mobility

ii. Human Errors - human beings are prone to make errors due to their physical, mental and driving limitaions. Therefore, transportation system should be designed to such a level of safety so that the scope for human errors is minimized and the harm is reduced when they occur.

iii.Public Concern - Safety of all segments of road uses must be the main concern of any road safety policy. Providers, enforcers and health authority must guarantee the best safety standards for all citizens, be they motorist, pedestrains, scholl children, elderly people, disabled persons, females or any other group.

649. 9

Further under zero tolerance, accident control measures would involve following four steps:

Reduce the exposure to traffic - efficient transportation, speed lanes and lane discipline and controlled land use are the important step to reduce risks from exposure to traffic.

Reduce the chances of accidents - it would require the three E's, viz, Traffic Engineering, Traffic Enforcement and Traffic Education.

Reduce the post-accidents harm - it would require efficient and effective emergency medical

In this background, the State would attempt to reduce the annual frequency of accidents to about 19000 from the present level of 39,000 by 2020 and to maintain zero growth further on in accordance to the UN Resolution. Further, road safety issues would be taken in a hloistic manner by covering accident abatement measures, accident insurance and compensation, early settlement of accident cases, and rehabilitation programmes for accident victims. Special consideration would be given to the disadvantageous section of the society and vulnerable road users.

CAUSE OF ACCIDENT AND MITIGATIVE MEASURES

Reasons for accident and Causative factors

Accidents occur due to combination of the following causative factors:

DUVERT

1. Driver related
2. User related
3. Vecicle related
4. Environment related
5. Road related
6. Traffic related

Driver related prominent causes

1. Lack of driving skills
2. lack of knowledge or non adherence of traffic rules
3. Drink driving and addiction to drugs

4. Fatigue and sleepless driving
5. Visual acuity of drives
6. Not dimming the lights at night
7. Over speeding and wrong overtaking manoeuvres at curves

Pedestrian/road user related causes

1. Non adherence to traffic rules
2. Careless walking on the carriageway
3. Crossing the road abruptly
4. Playing on the road by children
5. Careless boarding and alighting and sudden opening of doors of vechicles
6. Stretching the hands outside the vechicle
7. Carrying hazardous materials and over dimensional cargo in vechicles
8. Mental aberration and socila tensions
9. Unmindful of fellow passengers
10. Use of intoxicants whilwewalking/riding
11. Visual acuity problems
12. Not showing signals while turning, stopping and crossing the road
13. Lack of road discipline
14. Non obedience of traffic signal

Vechicle related causes

1. Lack of timely inspection and maintenance of vechicle
2. Usage of older vechicles on road
3. Poor vechicle lighting
4. Carrying hazardous material and oversized goods
5. Lack of in vechicle safety measure

Road related causes

1. Narrow road, weak culvert/bridge
2. Encroachments on road side

3. Distresses on the pavement
4. Level difference between carriageway edge and shoulders
5. Improper lane marking
6. Absence of proper signage system
7. Absence of adequate shoulders or service lanes
8. Absence of pedestrian facilities
9. Poor road geometrics
10. Slippery road surface
11. Improper design of super elevation
12. Poor street lighting facilities
13. Digging road for public utilities
14. Improper road side appurtenances
15. Lack of vertical clearance at bridges
16. Bill boards/road side advertisement
17. Lack of traffic control devices
18. Ribbon type land use development
19. Lack of safety barriers and traffic channelisers
20. Elements of surprise like check barriers., speed breakers etc.
21. Unorganised on street parking
22. Poor drainage
23. Lack of segregated bus bays
24. Parking of vehicles at the bell mouth of junctions

Traffic related causes

1. Dynamic and unpredictable nature of traffic
2. Traffic congestion and traffic conflicts at junctions
3. Heterogeneous traffic
4. Intermixing of through traffic with local traffic

OBSERVATIONS : NEED FOR A COMPREHENSIVE ROAD SAFETY ACTION PLAN

Assessment of the present facilities and practice of Road Safety Management in the project area brings out the fact that there are several areas of shortfalls and which need immediate attention.

The major areas of short false and solutions are:

Sl No.	SHORT FALLS	SOLUTIONS
1	Weak enforcement with regard to vehicle fitness, traffic violations by vehicles and road users	• Assured presence of enforcement officers at random check points • Constant surveillance by installing cameras and follow up actions on all violations • Immediate response to road accidents/incidents • Rerouting traffic in emergencies.
2	Frequent Violation of road rules by all type of raod users	• Strict on site inspection and fining for over speed, over load, Red light jumping, tailgating etc. • Conduction effective road safety awareness programs to different road user groups • Training to drivers on defensive driving techniques. • Training to goods vehicle drivers for carrying hazardous goods
3	Weak Trauma care System with regard to safe handling and transfer of victims	• Introduction of a comprehensive post crash management (PCM) system including cashless emergency medical

651

	within the Golden hour and making free medical treatment mandatory at hospitals for first two days	treatment to victims
4	Accident black spots	• Road Safety Auditing of all black spots in NH an SH and improved road safety engineering measures at critical locations.
5	Lack of Proper monitoring evaluation and accountability	• Introduction of a proper monitoring and evaluation system (M&E) and fixing accountability.
6	Mandatory Enforcement	• Wearing of helmet pillion drivers • Wearing of Seat Belt all passengers.
7	Lack of anticipatory measures during 3 months seasonal Sabarimala pilgrimage	• Additional Patrolling • Enhanced Surveillance • Disaster management, breakdown attending and Accident Rescue/Recovery of vehicles in Forest areas

KEY ACTION AREAS

The protective efforts of the Government would be pursued vigorously in order to realize zero growth of accidents by 2025. For this purpose following 21 key action areas have been identified.

1. Coordination and Management,
2. Quality of Road infrastructure,
3. Safety at Level crossings,
4. Crash Data Collection and Management System,
5. Sensitization of stakeholders and Raising Awareness about Road Safety Issues,
6. Road Safety Publicity and Campaigns,

7. Road Safety Education and Training,
8. Ensuring Safer Road Infrastructure,
9. Traffic Legislations and Enforcement of Traffic Laws, conduct patrolling through meger roads 24 x 7
10. Emergency Medical Assistance to Crash Victims,
11. Upgrading of Vehicle Safety Standards and Testing Procedure,
12. Strengthening of Traffic Police, MVD and Improving Law Enforcement,
13. Ensuring Safer Drivers and Setting up of Driver Training, Testing and Licensing Centers,
14. Undertaking Road safety Research and HRD,
15. Ensuring safety of Vulnerable Road Users,
16. Road safety auditing and improvement of vulnerable road stretches,
17. Strengthening Institutional and Financial Resources for Road Safety works, and
18. Implementation Strategy,
19. Installing surveillance cameras and other modern system like GPS, vehicle tracking and monitoring etc.,
20. Installing convex mirrors on sharp curves and making crash barriers to where ever necessary.
21. Preparing Mob. Apps regarding the specialties and specifications of all major roads, informations reg: major Junctions, Hospitals, Brake down services, Police, MVD, Fire and rescue , Help line numbers etc.
22. Provide wireless system, GPS, mobile Phones Audio, Rader, camera and wireless facilities in patrolling vehicles.

The following is the present strength of motor vehicles Department in Kerala.

Transport and Road Safety Commisionarate	-	1
No. of Mobile Enforcement squads	-	34
No. of smart Enforcement control rooms	-	2
No. of RT offices	-	18
No. of Sub RT. Offices	-	55
No. of Enforcement RTO	-	04

652

No. of Check post	-	19
No. of Zonal Dy. Tram Comm. offices	-	04

The table of road accident statistics during the last 4 years is attached here with for perusal.

Other mode of Transportation

Railway has 1148 Km of route length in Kerala. There are two railway divisions and 155 stations; operating about 100 passengers trains on prominent 13 routes. 15 stations come under the jurisdiction of Madurai Division. The present rail transport system in the state is week and exhausted the installed capacity and there is already excess demand also. Now metro rail construction is going on at Kochi and part of it is commissioned and started operation.

Air Transport Sector

Now there are 4 Airports in Kerala, Thiruvananthapuram, Nedumpassery, Karipoor and Kannur. Further as per the geographical structure of Kerala State, there is scope for 2 more Air ports, One at Erumely for Sabarimala-Kottayam, Pathanamthitta and Idukki Districts, and the other is between Palakkad and Trissur Districts near Guruvayoor. This will create an equilibrium in the air traffic sector in the state.

Port Sector

There are 13 major ports and 190 non major ports in India. Kerala has our major port Kochi and the second is under construction at Vizhinjam. Also another 17 minor ports in the State. There is one container terminal at Kochi. Transportation by coastal shipping is the check post mode especially for bulk commodities and for those long haul age traffic. Kerala has advantage of 585 km coast line through which bulk cargos can be transported if multi model transshipment longistics can be built up at intermittent points along the coast line.

Inland Water Ways

The Inland water system is feasible in backwaters of central and South Kerala. It is the most full efficient and environment friendly transport mode. This mode is now

mostly used for ferry and tourist transport. There are about 1687 km of IWT route network in the state consisting of the National water way No. 3 from Kollam to Kottappuram maintained by Inland Water Ways Authority of India and the other feeder canals maintained by the State Irrigation Department. The State water Transport Department with H.Q. at Alappuzha is providing much need connectivity to Kuttanad area also. This facility be extended to northern portion of Kerala –Malabar Area also. Now house boats are also in the field of tourism in the Inland Waters. The present utility of Inland water ways in Kerala State is very little. Using solar and LNG, this water transport system can be developed and transportation become cheeper, unpolluted and reduce the conjunction in the road traffic also. Hence made planning and effort for developing this system of transport with the help of the schemes of Central Government if possible.

Road Sector

Kerala has a vast net work of 1.5 lakh Kms of roads but only 1500 kms come under National High Way and nearly 25000 Kms come under public works Department. Even large portion of National Highways in Kerala have only single lane width.

The total number of road accidents in Kerala during 2016 is 39455 and death is 4171 major & minor injury is 44250. The total road accidents during the last 4 years is as follows. Total number of accidents 150043, No. of Death-16338, Major and minor injuries – No. of persons-168802.

Now Kochi promoting integrated mode of transport system and Vyttila Hub is developed to synchronies with this system. Modern information systems are also established here for helping the passengers. This type of integrated system is usefull for Kollam, Alappy, Kottayam, Thrissur, Kozhikkode, Kannur and Kasargode Districts. Metro system also can be implemented at Thiruvananthapuram, Kozhikode, Thrissur, Kollam and Kottayam after proper Studies as and when required Construction of metro rail between Nilakkal base camp & Pumpa is useful for minimizing the traffic and accident in that sector and also helpful for crossing of wild animals in the forest. Most of the accidents in this Sector is due to the fatigue,

653

negligence and rashness of drivers. We can reduce the increased Vehicle flow, conjunction, rate of accidents and causalities by introducing Metro rail System in any sectors. Pollution also become minimum.

THE PROJECT

The Safe Zone Sabarimala is a project providing regulation of traffic in the season by patrolling, camera surveillance, GPS, Vehicle tracking system and other modern amenities round the clock. Also deploying mechanical staff, spare parts, brake down attending vehicles, Mobile tyre puncture units, Ambulances, trauma care units, and coordinating main stake holding departments like Police, Fire and Rescue, Forest, Health, PWD, Revenue, Travancore Devaswam Board, KSRTC, KSEB, BSNL and Water Authority. By this 24×7 project the M.V. Department regulating nearly 80 Lakhs vehicles along with other normal traffic with out any traffic block. This year repaired 6411 vehicles in the forest area, rescued and recovered 229 vehicles met with major and minor accident.

The lack of coordination between Government Departments in time is the main cause of our retardation in implementation of activities and projects in the state. This project will coordinate all stake holding departments like MVD, Police, Fire and Rescue, Health, NHAI, PWD, Education , Revenue, Forest, Excise , KSEB, BSNL, Water Authority, Road Transport, Water Transport, Rail, Metro, Airports and Ambulances, Crains, recovery Vehicles and Associations of Auto /Taxi, Head load Workers connected with road accidents, disasters and natural calamity " Prevention is better than cure" will be implemented.

Similarly it is necessary to prepare a project Safe Kerala for the entire State of Kerala, for regulating and monitoring the traffic in the state. Now kerala motor vehicle Department operating 34 patrolling – enforcement squads in one shift, 8 hours only, in 14 districts. Considering the length of N.H, S.H, District and other, major roads and a vehicle population of nearly 1.5 Crore, the development of infrastructure and increasing the facilities of the Lead Department is very important to meet the directions of the Hon. Supreme Court committee on Road Safety.

Considering the road accident statistics in Kerala for the last 10 years the following are the actual findings.

1. The hierarchy of the rate of road accidents and fatalities in the State of Kerala district wise is as follows Ernakulam, Trivandrum, Trissur, Kollam, Kozhikode, Alappuzha, Malappuram, Kottayam, Palakkadu, Kannur, Idukki, Kasargode, Wayanadu.
2. Number of accident in National High Way is higher than that of State high ways.
3. The main cause of 96% accident is due to rash and negligent driving.
4. Due to drunken driving - 1.5%
5. Other reasons - 2.5%
6. Accident during day time - 72.5%
7. Accident during Night time - 27.5%

In the state of Kerala on a comparative study between, enforcement compounding fceses and accident rates during the last five years we can observe the minimum no. of accident and maximum enforcement and comp fee collection made during 2014-15.

Like wise the prestigious Road Safety Activity in Kerala. 'Sabarimala Safe Zone' also made its maximum result emphasizing the importance's of continuous patrolling, immediate rescue works and co ordinations with other departments.

The project includes the constitution of 85 patrolling teams for conducting patrolling throughout the entire suggested roads in Kerala State round the clock for regulating traffic, enforcement and also constituting 14 fully equipped controlling stations in head quarters of 14 Revenue Districts for controlling and co ordinating the above patrolling teams and other stake holding departments.

The anticipating additional staff strength is as follows:-

1	Regional Transport Officers (Technical)	-	10
2	Joint Regional Transport Officers (Technical)	-	14
3	No. of Motor Vehicle's Inspectors	-	221
4	No. of Asst. Motor Vehicle's Inspectors	-	229
5	No. of Head Accountants	-	14

654

6	No. of U.D. Clerk	-	14
7	No. of L.D. Clerk	-	14
8	MVD Executive . Assistants	-	255
9	Controlling Office Assistants	-	126
10	Drivers	-	263
11	Last grade employees (Peon)	-	14
12	No of House Keeping Staff	-	14
12	No. of new vehicles required	-	65

1. If 24/7 alertness and monitoring is the policy, this can provide smooth, safe and secure transport for people and cargo.
2. This will also result in reduction in crime rates, and quicker resolution of crimes.
3. In case of accidents, it will be possible to expedite rescue operation and get the injured to hospitals within "golden hours".
4. Through the use of video surveillance, GPS vehicle tracking etc., it will be possible to prevent and reduce crime.
5. It will be possible to re-route traffic based on congestion and traffic patterns.
6. Rescue and disaster management can be successfully and efficiently implemented through the co- ordination of various government departments including Motor Vehicles, Police, PWD, NHAI, Fire and Rescue, Health, Revenue, BSNL, KSEB, Water Authority, Forest, Excise, Railways, Airports and Water Transport.
7. If helipads can be provided in N.H toll booths and main road junctions in the state wherever possible, rescue operation can be further streamlined and expedited.

For minimizing the accident, causality, and for smooth 24×7 uninterrupted traffic in the state, the following minimum facilities and establishment are required.

51 numbers of patrolling squads in addition to the existing 34 numbers.

Patrolling will be conducted 24×7 in all major roads in the state.

Surveillance cameras install in all major roads and junctions from boarder check post onwards.

Installation of wireless system in all patrolling vehicles, border check posts, controlling stations is inevitable.

Establish controlling stations in all district head quarters with all modern amenities.

GPS and Vehicle Tracking facility is also necessary in all patrolling vehicles and controlling Stations.

65 new vehicles are required for uninterrupted patrolling and supervision in addition to the old ones.

Solar warning lamps and signal lights are to be erected wherever necessary with out delay

Erection of informatory, mandatory and Cautionary sign boards, mentioning help line numbers in appropriate places.

Remove unwanted structures advertisements and flex boards from the side of roads those violating the IRC coding. and blocking proper vision.

Controlling Stations

It is proposed that there should be 14 controlling stations ie. each in every Revenue District. The Head of the controlling station shall be RTO. They in turn will report to the Transport Commissioner. They have to assign, distribute duties and supervise the functions of patrolling teams. They will also co-ordinate and communicate with all other Stake holders including vehicle dealers and mechanics.

The JRTO's will manage the controlling stations, supervise patrolling teams and conduct occasional checking along with the patrolling teams on a rotation basis. Whenever they come across some abnormalities, defects or any other problems with roads, they are to bring it to the notice of the concerned RTO and inform all the stake holders for the immediate rectification. They will also ensure that there is no laps in the 24×7patrolling/Checking. After conducting effective "Zatta" communication with all the patrolling teams between 7.30 AM-8AM in the morning and 7.30 pm-8pm in the evening RTO/JRTO, will pass on all relevant and statistical information to the

655

Transport Commissioner and Zonal Dy Transport Commissioner everyday in the morning by E-mail.

Zonal Deputy Transport Commissioner should organize periodical training programmes for the patrolling/checking teams for updating the modern amenities equalified in the vehicles and controlling stations. Also, arrange training for first aide and trauma care.

The vehicles are to be fitted with specified top lights, GPS, audio system camera, speed radars, road safety equipments, reflecting jackets for officers, fire extinguisher, torch light, light hatten, glowers, first aid kit, rain coats etc.

Check posts, Sub. R.T.O. Offices, R.T.O. Offices, Control rooms, Police Stations, NHAI, PWD, Health Education KSRTC, KSEB, BSNL Water Authority, Patrolling Vehicles, Hospitals, Ambulances, Crannies and Recovery Vehicle groups, Garages, Vehicle dealers, showrooms and Service centers. Fire and Rescuer offices, Ambulances, Airports, Rly Stns, Bus Stands, Taxi/ Auto Stands on roots, Toll booths Warf's and Boat Jetty's are to be co-coordinated through communications systems.

All major routs, bye- passes and short cuts are traced and prepare an App and up date with directions then and there.

All patrolling teams observe their major roots every day and report the defects and abnormalities, to controlling stations, and from their to concerned dept. with out delay. Install surveillance cameras through out the major roads, major junctions and observe through monitors in control Stations and take appropriate action and follow ups.

The controlling officer is in contact with police control rooms and other depts. and give timely intimations and directions to patrol teams.

Install MVD check posts in all state border roads. (e.g. Chinnar, body mettu, Cumbum mettu, Neyyar dam, etc.)

Install GPS and vehicle tracking system and monitors in control rooms. Establish and co-ordinate cranes and recovery vehicles in all required places as and where required. Conduct study regarding the defects of roads, vehicles, black spots and give periodical reports to concerned authorities regarding in time.

Procedure and functions

1. Arrange controlling stations every District head quarters with all modern amenities like surveillance camera monitoring, GPS and Vehicle tracking system, Internet 4 G connectivity, computers, printers, wireless, mobile phone with help line numbers etc.
2. Prepare the major and important routs for patrolling, collect data's of Vehicle Dealers, service points, other general garages, Petrol pumps, Hospitals , Fire and Rescue offices, Police stations, Road rout , Water Transport And Airport Authorities, Revenue, RTO, Sub RTO offices, check posts, craines and other vehicle recovery groups, Taxi/ Auto / Head load workers organizations. Education institutions, MVD and Police Patrol/ teams, KSEB and BSNL offices, Water Authority and for co-ordination and speedy action.
3. Health Department also conducted survey through out Kerala and allocated 315 Ambulance Points including 35 Government Hospitals for providing quick rescue work, with in 15 minutes of accident.
4. These patrolling teams propose to conduct patrolling through all major and important roads in their sector from 8 AM to 8 PM and 8 PM to 8 AM and act as follows
   a) While patrolling conduct checking at intermediate points, take action against rash and negligence with out wearing headgears and seat belts, driving vehicle without 3rd party insurance, jumping red lights, over-loading, driving using mobile phone, drunken driving etc..
   b) Regulate traffic if necessary.
   c) Watch school buses and regulate them.
   d) Take action against parking in no parking and other prohibited areas.
   e) Watch the condition of roads, dangerous trees, telephone posts and electric posts on the side of the roads potholes and reporting them and follow up till rectification.

f) Search for vehicle with out C/F, Pt and tax and poor mechanical conditions.

g) Implementation of lane traffic.

h) Solving traffic blocks in the peak hours.

i) Visiting bus stands, hubs, rail way stations parking places etc.

j) Conduct a minimum of 150 kms patrolling in one shift in normal days.

k) Give proper information's in Zatta communication

l) Attend vehicle brake downs and give proper information to drivers and service authorities; passengers and clear road blocks with out delay

m) Rush to accident spot, conduct proper rescue work, co-ordinate the activities with out panic, hospitalize the injured, remove road block with out delay, saving the golden hour

n) Give proper information to control office, in time and seek advaise and help if necessary

PATROLLING TEAMS

The staff strength of the patrolling teams are as followers

Motor Vehicle Inspector	-	1 x 3	=	3
Asst. M.V Inspector	-	1 x 3	=	3
Executive Assistant	-	1 x 3	=	3
Driver		1 x 3	=	3
Vehicle	-		=	1

Total staff strength for a patrolling team for 24 hrs is 12.

For uninterrupted patrolling and enforcement need additional squads

Eranakulam	-	4
Thiruvananthapuram	-	4
Thrissur	-	4
Kollam	-	4
Alappuzha	-	4
Kozhikode	-	4
Malappuram	-	4
Kottayam	-	4

Palakkadu	-	4		
Kannore	-	4		
Pathanamthitta	-	3		
Idukki	-	4		
Kasargod	-	2		
Wayanadu	-	2		
The number of assisting squads is			=	34
The total number of squads will be	-	51+34	=	85

The Patrolling teams can be coded as MVD Patrol 01/1,01/2, 01/3 etc.. for Thiruvananthapuram. MVD Patrol 02/1,02/2, 02/3 etc.. for Kollam and MVD Patrol 14/1,14/2, 14/3 etc.. for Kasargod etc...

The patrolling teams conduct patrolling through the selected routs of the districts in every shift and watch parking, junctions, rash & negligent driving, abnormalities and defects of roads, take photographs and report to control rooms. Conduct periodical checking, verification of currency of records, general mechanical conditions of vehicles, lane traffic, overloads, drunken driving, advertisement on road side , those violating IRC code. The staff will be provided with laptop computers having Wi-Fi, so that they can get updated data's and information from Vahan Saradhi and other sites. Also they are directed to help all road users , drivers of defective vehicle; The patrolling teams are liable to attend vehicles met with accident, brake down etc. then and there; Co-ordinate rescue works co-coordinating ambulances mechanical teams recovery vehicles hospitalize injured persons, inform higher authorities submit detailed report to concerned RTO and Transport Commissioner. Every day report details to control room on zatta communication.

All vehicles are fitted with wireless system, G.P.S, with speaker system, cameras, and computer system. Also provided with road safety equipments, fire-extinguisher, rope, mobile phone, etc.

Each patrolling team do their duty from 8 AM to 8 PM and the other team should start from 8 PM to 8 AM. The 3rd team 8 AM to 8 PM so each team will get a resting time of 24 hours periodically. This duty pattern is applicable for control rooms also.

657

Date	I Shift 8 AM to 8 PM	II Shift 8 AM to 8 PM	Rest	Date
1	A	B	C	2
2	C	A	B	3
3	B	C	A	4

Thiruvananthapuram

In Thiruvananthapuram Revenue District there are Three RT Offices, 4 JRT offices and two MV check posts and 2+2=4 enforcement squads.

State Capital Having National Highways, District and other roads, Railway Divisional Office, International Airport, Vizhinjam Port, and Inland water sources without proper utility and co- ordination . Also having Govt. Medical College, Private medical college, Homeo and Ayurvedic medical colleges and many private hospitals and other super specialty hospitals Sreechithra etc. During 2016- number of M. V Accident is 5420, death 519, injured 6240.

In the new arrangement we propose to install surveillance cameras in almost all major Junctions, Highways, connecting with control rooms. The control room Co-ordinate All patroll teams, Police, Fire and Rescue, Hospitals, PWD, Revenue Health, NHAI, KSEB, BSNL, Water authority, Mechanical teams of all vehicle manu-facturers, major NGO's, like Vyapari Vyavasayi Association, Head load workers unions, A/R / Taxi workers, Recovery Vehicles, Crain, JCB etc. as and when required . The directory of above teams will be prepared and included in the mob. App.. One existing control room is there.

01. Thiruvananthapuram

No. of existing enforcement RTO	-	1
No. of existing patrolling teams	-	4
No. of additional squads proposing	-	4
Total No. of patrolling squads	-	4+4 = 8
No. of new vehicles required	-	4+1 = 5

02. Kollam

Recommended number of new patrolling teams	-	4
Total number of patrolling teams	-	4+3 = 7

Bus stands, Railway stations, and in land water system and helipads also is there

No . of new vehicles required - 4+1 = 5

03. Pathanamthitta

Recommended number of new patrolling teams - 03

Total number of patrolling teams - 3+2 = 5

No. of new Vehicle required - 3+1 = 4

The additional responsibility of the Co-ordinating duty of Safe Zone project also is there. Bus stands, Railway station at Thiruvalla and helipads also as infrastructure.

04. Alappuzha

District having Railway stations, Bus stations, Port, Inland water hubs, Helipads, N.H, State Highways, Hospitals, etc. Having RT Office, Five Sub RT Offices and 2 enforcement squads at present.

No. of present required - 2

Newly proposed Sqauads - 4

Total No. of Squads - 4+2 = 6

Vehicles required - 4+1 = 5

05. Kottayam

One RT Offices and 5 Sub RT Offices

No. of present squads - 2

Newly proposed squads - 4

Total No. of squads - 6

No. of Vehicles required - 5

N.H, State highways, helipads, inland water way, Railways, Bus stations , Medical colleges, Hospitals.

06. Idukki

One RT Office and 4 Sub RT Offices. One check post at Kumaly. Body met and Cumbum mett are proposed Check posts. High range roads, having N. H and State highways. Helipads, bus stations, Idukki and Mullaperiyar reservoirs.

658

No. of squads	-	2
No of newly proposed squads	-	4
Total No. of squads	-	6
No. of Vehicle required	-	5

07. Ernakulam

Dy. Transport Comm. Office, 2 RT Offices and 7 Sub RT Offices, One control station, and one enforcement RTO. No check post and 4 patrolling squads, Dy. Transport Comm. office. Area having Two airports, Two ports, One is container terminal, helipads, Heavy industries, Medical colleges, High court, Inland water facilities, Metro Rail, Vytila hub, railway stations, N.H District, other high ways.

No. of RTO (Enforcement) existing	-	1
No. of Present squad	-	4
Newly proposed squads	-	4
Total No. of squads	-	8
No. of Vehicle required	-	5

08. Thrissur

Dy. Transport Comm. Office, RT Office and 4 Sub RT Offices, no check posts and 3 enforcement squads + one enforcement RTO

No. of RTO (Enforcement) existing	-	1
No. of present squad	-	2
Newly proposed squads	-	4
Total No. of squads	-	6
No. of vehicle required	-	5

N.H, S.H, and other highways, Railway stations, Inland water ways, helipads, Bus stations, Medical colleges, Universities, Hospitals, Gurvayoor Temple, Pooram Festival are the considerable factors. In future scope for an airport is there in between Guruvayoor,Thrissur and Wadakkancherry.

09. Palakkadu

One RT Office, Six check posts and 5 Sub RT Offices, 2 Enforcement squads at present. Medical college, Industries, Hospitals, N.H, S.H. Railway stations, Bus stations, and shallow canals.

No. of present squad	-	2
Newly proposed squads	-	4
Total No. of squads	-	6
No. of Vehicle required	-	5

10. Malappuram

One RT Office, 3 Sub RT Offices, One check post and two enforcement squads at present. N.H, S.H, Karippoor International Airports, Railway Stations, hospitals facilities.

No. of present squad	-	2 Nos.
Newly proposed squads	-	4 Nos.
Total No. of squads	-	6 Nos.
No. of Vehicle required	-	5

11. Kozhikode

One Dy. Transport Comm. Office, Two RT Offices, One enforcement RTO, 4 enforcement squads, one co-ordinating stations and Sub RT Offices are the present strength of this district.

N.H, State other highways, Railway stations, Bus stations, Port, Inland water ways, proposed for metro rail, Airport, helipad, Universities, Medical colleges, Industries, Hospitals, are the facilities.

No. of RTO (Enforcement) existing	-	1
No. of measured	-	4
Newly No. of squads	-	4
Total No. of squads	-	4+4= 8
Vehicles required	-	5

12. Wayanadu

High range District, One RTO, 2 Sub RT Offices, two check posts, One enforcement squad are the present strength

N.H, State highways, hospitals, are the bus stations present infrastructural facilities.

No. of present squad	-	1
No. of newly proposed squads	-	2

659.

Total No. of Squads	-	3
No. of vehicle required	-	3

13. Kannoore

One RT Office, 2 Sub RT Offices, and two enforcement squad is the present strength of this district.

N.H, S.H, other roads, Bus stations, Inland water ways, Airport, Railway stations, helipad, Medical colleges, Hospitals, are the present facilities.

No. of present squad	-	2
Newly recommended squads	-	4
Total No. of squad	-	4+2 = 6
No. of Vehicle required	-	5

14. Kasargod

One RT Office, One Sub RT Office. 3 Check posts, Enforcement squads are the present strength. N.H, S.H, other roads, bus stations, Inland water ways, Helipad, Railway stations are the present infrastructure facilities.

No. of present squad	-	1
Newly recommended squads	-	2
Total No. of Enforcement squads	-	3
No. of Vehicle required	-	3

CONTROLL STATIONS

It is necessary to monitor, co- ordinate, record, Communicate the day to day working of the patrolling teams with out laps. For that a specific regular chart, Zata communication, recording and reporting to higher authorities and passing required information's to other departments is important.

1. The controlling stations Install at district head quarters for the safety and easy administration and control.
2. These stations are equipped with monitor, G.P.S, Vehicle Tracking facility with computer recording and backup facility.
3. Needed uninterrupted power system .
4. Equipped with wireless facility, mob phone assisted help line numbers.

5. Daily having Zatta communication and recording of activities of squads including patrolling distance and routes, No. of offences detected, Accident occurred, Action taken, brief explanation, abnormalities or defects of road and other infrastructure observed; Number of brake downs attended and assisted etc. at 7.30 AM.

STAFF PATTERN

1. All controlling stations headed by one technicaly qualified RTO and assisted by one JRTO (Tech. qualified)
2. Three AMVI's are required for round the clock observation every day.
3. No. of Head Accountant required – 1
4. No. of U.D. Clerk required – 1
5. No. of L.D. Clerk required – 1
6. Last Grade (Peon) – 1
7. Part time (House keeping) – 1
8. 3 x 3 = 9, on daily wages from Kudumbasree or any other NGO based, technical personnel (computer based) required, 3 in each shift for the monitoring of screens, taking prints of memos, get signed by AMVI's and dispatch them and assist day to day function of control room 24×7
9. The control stations are under the concerned Enforcement RTO and the supervising officer of corresponding controlling stations and collect all details from controlling stations and report to each DTC's and to Transport Commissioner every day
10. All control rooms must be connected with police control rooms in the respective districts and other department head quarters of health PWD, NHAI Police, Revenue, KSEB, BSNL, Water Authority, Fire and Rescue, KSRTC etc and other State holders.
11. Install surveillance cameras enroute N.H, S.H other important roads and junctions check posts and connected with control stations of each districts respectively.
12. All patrolling vehicles and supervising vehicles will be fitted with G.P.S, wireless and cameras and monitored in the control stations.
13. In the case of important and complicated issues, highway Police and MVD petrol can act together and achieve good results.

660

14. Give proper periodical training for patrolling teams and higher authority for updation in the technical knowhow and crowd management.
15. All patrolling teams and control stations are connected with check posts also for quick and immediate implementation of actions.
16. All hospitals, Police stations, fire and Rescue offices, recovery vehicle groups NGO's vehicle dealers, mechanics and service personnel's are in mutual contact for the success of this project and co- ordinate sincerely.
17. The regular supervision, reporting, verification of activities and inspection are also done periodically without fail by concerned higher authorities.
18. The dedication of staff members and co- ordination of all departments is the base of success of this project.
19. The in-charge of control station should collect the statistical details and other information's regarding the defects of roads, surroundings and other maters, and get recorded and report to District Road Safety Council concerned department and also to Road Safety Commissioner and do the follow up work also
20. The enforcement RTO's verify the work done and efficiency of each staff, member evaluate and report periodically. They are also responsible to monitor the activities, results progress and give rewards and appreciations to deserved persons.
21. Constant and regular vigil required for avoiding bribery and other illegal activities in the system.
22. Enforcement RTO and concerned JRTO's are also directed to study the problems and issues evolving and make solutions with the help of Police, Railway, Water Transport, Airport Road authorities with the help of District Collector.
23. Prevention is better than cure is one of the moto.
24. Officers required for controlling Office. The existing control stations are not perfectly organized

No. of Enforcement RTO's required	-	1×10	=	10
No. of Joint Regional Transport	-	1 × 14	=	14
No. of AMVI required	-	1×3×14	=	42
No. of Head Accountants	-	1×14	=	14
No. of U.D. Clerk	-	1×14	=	14

32

No. of L.D. Clerk	-	1×14	=	14
No. of office assistants comp. personal (System administrator)	-	3 ×3×14	=	126
No. of Drivers	-	1×3×14	=	42
No. of last grade employee (Peons)	-	1×14	=	14
No. of House keeping staff	-	1 x 14	=	14
No. of vehicles required for the control stations- for Supervision purpose		1 x 14	=	14

The total staff members and vehicles required for the project

Total No. of Controlling Stations	-	14
Total No. of Patrolling squads	-	85
Total No. of RTOs	-	14
Total No. of Joint RTOs	-	14
Total No. of MVI's required	-	255
Total No. of AMVI's required	-	255+42 = 297
Total No. of Head Accountants	-	14
Total No. of U.D. clerks	-	14
Total No. of L.D. Clerks	-	14
Total No. of Executive Assistants	-	255
Total No. Drivers required	-	255+42 = 297
Total No. of Control Room Assistance (System Administrator)	-	126
Total No. of Last Grade Employees (Peons)	-	14
Total No. of House keeping staff	-	14
Total No. of vehicles required	-	99

Present Staff strength

Enforcement RTO	-	04
MVI's	-	34
AMVI's	-	68
Drivers	-	34
Available vehicles	-	34

661

Hence the following newly posts are to be created for this inevitable project.

No. of Regional Transport Officers	-	10
No. of Joint Regional Transport Officers	-	14
No. of Motor Vehicle Inspectors	-	221
No. of Asst. Motor vehicle Inspector	-	229
No. of Head Accounts	-	14
No. of UD Clerks	-	14
No. of LD Clerks	-	14
No. of last grade employees (Peons)	-	14
No. of Executive Assistants	-	255
No. of Drivers	-	263
No. of Controlling Office Assistants (System Administrator)	-	126
No. of House keeping staff	-	14
No. of new vehicles required	-	65
Total number of new staff required in all categories	-	1188

I Expecting Expense

Anticipating Expenditure (recurring)

Sl No	Post	No	Scale of Pay	Total amount
1	RTO	10	45800-89000	5954000
2	Jt. RTO	14	40500-85000	6001200
3	MVI	221	39500-83000	113483500
4	AMVI	229	32300-68700	96157100
5	HA	14	27800-59400	5059600
6	UDC	14	25200-40000	4586400
7	LDC	14	19000-43600	3458000
8	Peon	14	16500-35700	3003000
9	MVD Ex.Assistats	255	255 x 600 x 30 x 12	55080000

10	Driver	262	262 x 18000 x12	56592000
11	Controlling Office Assistants (System Administrator)	126	600/Day	27216000
12	House keeping	14	7900	110600
	Sub Total			**348837400**

II Non Recurring Expenditure

1. Realising of Vehicles With Equipments
   65 X 10 Lakhs = 65000000
2. Controll Offices 14 X 5 Lakhs = 7000000

Sub Total = 72000000

Grand Total = **420837400**

The present Comp. fee collection during 2016 – 2017 is Rs. 870620350

Number of patrolling teams		Average Comp fee Collection Per Year	
Present	Anticipated	Present (3 Yr average)	Anticipated (in the new rate)
34 One Shift	**85** 3 Shifts	**87.71Cr.**	**> 300 Cr**

These Calculations made of as per the existing rate of compounding Fees. Central Govt. is planning to increase the rate of compounding fees and penalties for minimising the offences and crimes. To face and cope with these changes the Department and State Government has to develop and modernize the Department and staff strength of enforcement wing for round the clock patrolling.

Considering these features the expenditure mentioned above (recurring and non – recurring) are very little compared to the income generating in the future. By the implementation of this project State of Kerala can archive total control of traffic, security and confidence for the public and get an additional income of Rs. 250 crores/ year.

The statistical statement of compounding fees, offences, penalties, accidents, number of posts are enclosed with this report for verification.

CONCLUSION

By the implementation of this **"Safe Kerala"** project the Govt. can control and regulate the traffic in the state 24×7. The 85 patrolling teams of the Lead Agency, Motor Vehicle Department and the 46 highway patrolling teams of Kerala Police will covering more than 10000 kms of roads every day and night by patrolling. While this enforcement patrolling is going on, the State will get an approximate income of Rs. 250 crores per year as compounding fee and penalty as per the new rate of Compounding fee; Also the reduction in number of accidents and fatalities procure a limitless prosperity and peace among citizens. The road block will get minimized and gaining time, fuel and less pollution also.

The quick and timely attention on brakedowns and accidents, will create confidence among travelling passengers and vehicle owners. The coordinated rescue work on road will create confidence and new culture among public. Round the clock patrolling and presence of officers in uniform on road and the camera surveillance also reduce the general crime rate in the state. The confidence of drivers and passengers will increase and 24 hour utility of roads and other travel mode will take place gradually, with out any additional expenditure from the treasury. More over the coordination of entire Stake holding departments will take place and get energized and alert also.

This project is similar to Banyan tree, which gives shade, emit Oxygen and Ozone in day time, shelter for birds in the night and accumilating energy from lightening, thunder and transferred to earth through its tissues protecting everybody. Like this the patrolling teams of MVD and Police will keep good vigilance on road by patrolling and through video, surveillance, GPS, Network systems attending and helping, vehicles met with brakedowns and accidents with out delay: Also helping the humanity and the society by preventing and rescuing from accidents and crimes. Also getting revenue as compounding fee to meet the expenditure of this activity, and fund for repairing and maintenance of roads and infrastructure After all the State will get a unique position in the Global Tourism Sector like Singapore and other developed countries in the case of safe transportation and infrastructural facilities. Also get

appreciation from the Hon. Supreme Court Committee on Road Safety for the good results achieving in the field of road safety.

As per the direction from the Transport Department of Kerala, conducted study and prepared this Detailed Project Report " SAFE KERALA" and submitting for perusal and implementation to reduce the road accidents and provide safe and regulated traffic in all sectors 24×7 in the state of Kerala by the Special Officer of "Safe Zone".

Yours Sincerely and Faithfully

P.D Sunil Babu
Traffic Safety Expert
Kerala Road Safety Authority
Special Officer Safe Zone 2015-16 & 2016–17
Regional Transport Officer(Enf) Rrd
South Zone
Thiruvananthapuram

Thiruvananthapuram
30.06.2017

Annex. III

കേരളാമോട്ടോർ വാഹനവകുപ്പ്

No.E1/12861/2013-TC

Transport Commissionerate, Kerala,
2nd Floor, Trans Towers, Vazhuthacaud, Thiruvananthapuram-14,
[☎ 0471-2333337/2333317 FAX 0471-2333314]
[e-mail - tcoffice@keralamvd.gov.in
Date :20/01/2018

From

The Transport Commissioner
Thiruvananthapuram

To

The Secretary to Government
Transport Department
Thiruvanathapuram

Sub:- Motor Vehicles Department –Safe Kerala Project Furnishing of revised proposal- Reg.

Ref:- letter No 377/Secy/Trans dated 27/12/2017 of Secretary Transport Department

Kind attention is invited to the reference cited above. The revised proposal for the proposed "Safe Kerala" project is enclosed here with.

The proposed Safe Kerala Project is mainly aimed at round the clock Enforcement which involves detecting offences on the road and generating check reports which can be compounded. Compounding fee collected by the field officers has to be accounted to State exchequer. Accounting of compounding fee involves financial matters and handling of Government Revenue which cannot be outsourced. Matters such as Initiating legal action against the uncompounded offenders, Driving Licence suspension, etc involve handling of public documents, outsourcing of which will cause adverse legal implications. As per the directions of the Supreme Court Committee Licences in respect of some Traffic offences has to be compulsorily suspended. For handling of such offenders and continuing the subsequent legal proceedings timely action is required and hence the accountability of the persons involved in this regard has to be ensured. Outsourcing cannot ensure accountability of Government money and responsibility cannot be fixed for inaction/default on the part of Outsourced employees

Since huge amount of cash transaction are involved by way of remittance of field compounding fee and the fee remitted by the public across the counter, there is every chance of embezzlement and misappropriation and the Department will not be able to fix responsibility and recoup the money if outsourced personnel handles this. The processing of legal documents, charge memos and the Driving License suspension

820

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process also has to be handled at the Control Room which can't be entrusted to outsourced personnel, which will invite adverse legal implications.

For the reasons stated above, it is recommended for the posting of one Head Accountant and two Clerical staffs in each control rooms (Total 14 Head accountants and 28 Clerks) to ensure the accountability of Government Money and the purpose of processing further action against the offenders.

Yours faithfully,
Sd/-
Transport Commissioner

Approved for issue

23.1.2018

Joint Transport Commissioner(Enforcement)

290/2022/TRANS(OS)

TRANS-A2/19/2022-TRANS

74

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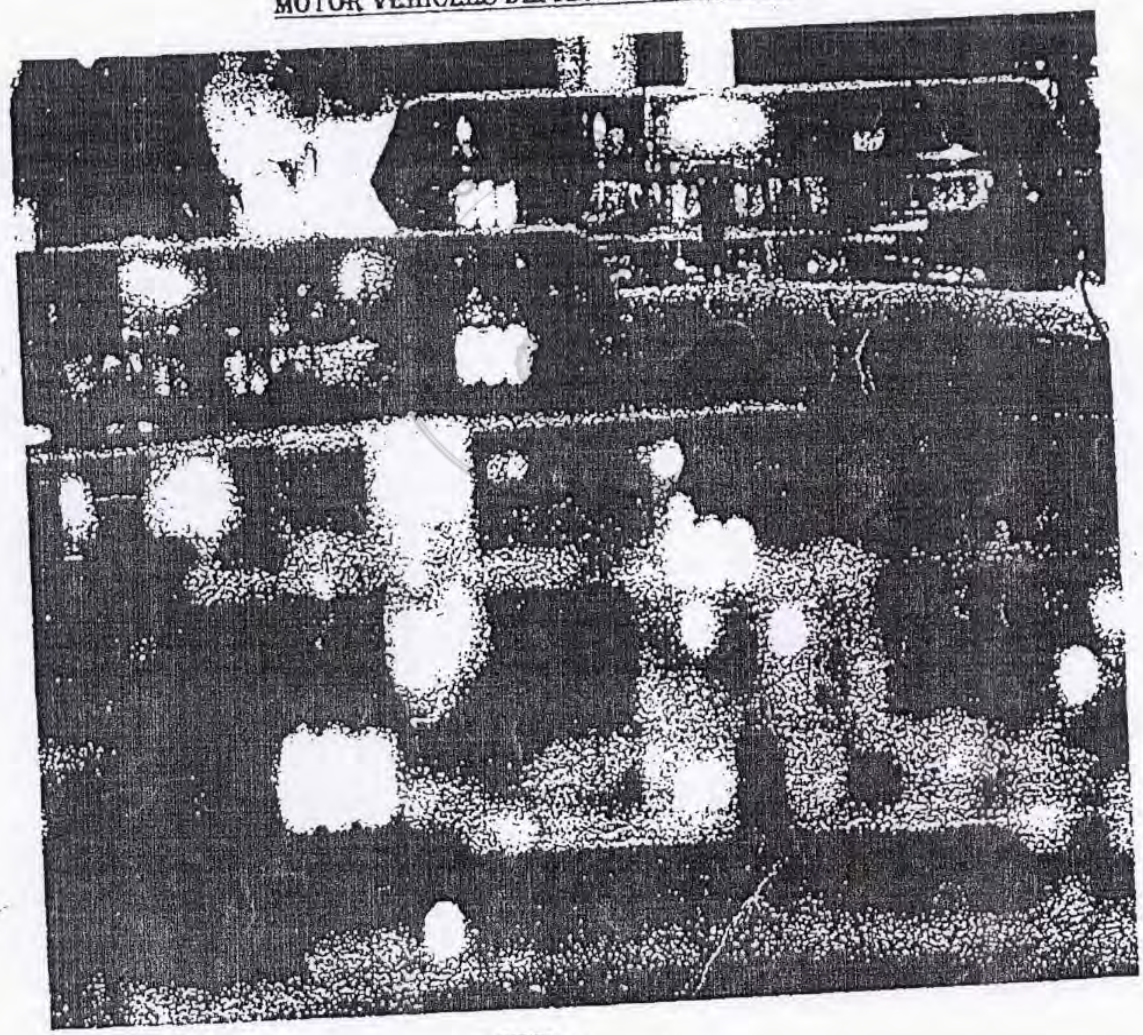
74

SAFE KERALA

PROPOSAL FOR SEPARATE ENFORCEMENT WING OF

MOTOR VEHICLES DEPARTMENT , KERALA



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AIM :-

- To curb road accidents and consequent fatalities and injuries
- To ensure safe journey and transportation by road
- To induce a disciplined road culture

SCOPE :-

- Strengthening the enforcement wing of MVD.
- District wise well-equipped modern control rooms.
- 24 X 7enforcement and patrolling.
- All enforcement related works like issue of hearing notice, suspension of driving licenses, permit, prosecution etc ...
- Regular awareness classes for various categories of public and drivers
- Compulsory correctional classes for traffic rule violators.
- Co-ordination of rescue operation
- Accident Inspection and Cause analysis
- Prevention of tax evasion
- Reduction in the Rs.1500 crores loss incurred by government by way of accident

290/2022/TRANS(OS) 75 TRANS-A2/19/2022-TRANS

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ACCIDENT SITUATION:-

- In 2016,
  - 39420 ROAD ACCIDENTS,
  - 4287 ACCIDENT DEATHS,
  - 44108 INJURIES

20% increase in the number of road accidents in 2016 compared to 2015.

- In the current year 2017, from January to October ,
  - accidents reduced by 3.7%
  - fatalities reduced by 10%

Strict enforcement and stringent punishment like suspension of Driving License for the offences as per the direction of hon'ble Supreme Court Committee on Road Safety has made this reduction possible

MAJOR CAUSE OF ACCIDENTS: - LACK OF ROAD DISCIPLINE

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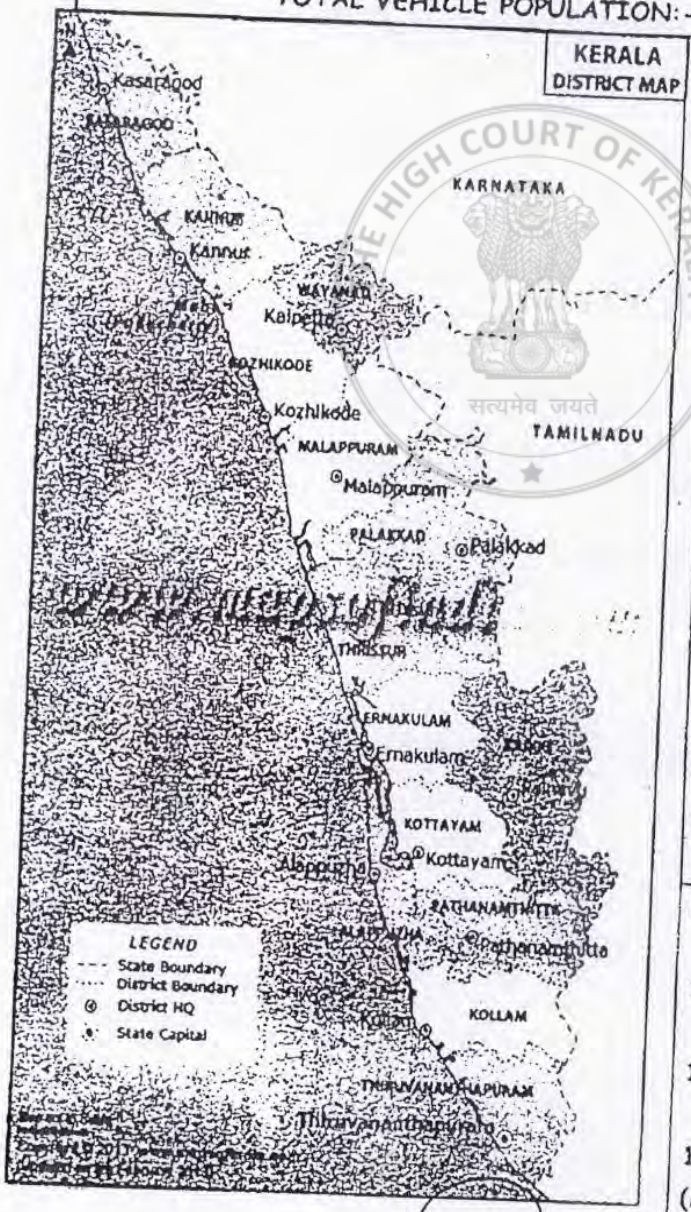
921290/2022/TRANS(OS) TRANS-A2/19/2022-TRANS

799

KERALA -At a glance

KERALA -GOD'S OWN COUNTRY
TOTAL AREA:- 38,863 sq.km
LENGTH OF NATIONAL HIGHWAY:- 1524 km
LENGTH OF STATE HIGHWAY:- 4341 km
TOTAL POPULATION:- 3.45 crore(as on 2017)
TOTAL VEHICLE POPULATION:-1.11 crore(as on 2017)

KERALA DISTRICT MAP



Districts :- 14
Biggest District:- PALAKKAD Smallest District:- ALAPPUZHA
Highly populated-MALAPPURAM Less populated - WAYANAD
Highest population density - THIRUVANANTHAPURAM Least population density - IDUKKI
Highest no. of accidents - ERNAKULAM Least no. of accidents - WAYANAD
EVERY DAY, 108 ROAD ACCIDENTS 12 FATALITIES 121 INJURED (MAJOR & MINOR INJURIES)

TRANS-A2/19/2022-TRANS

290/2022/TRANS(OS)

76

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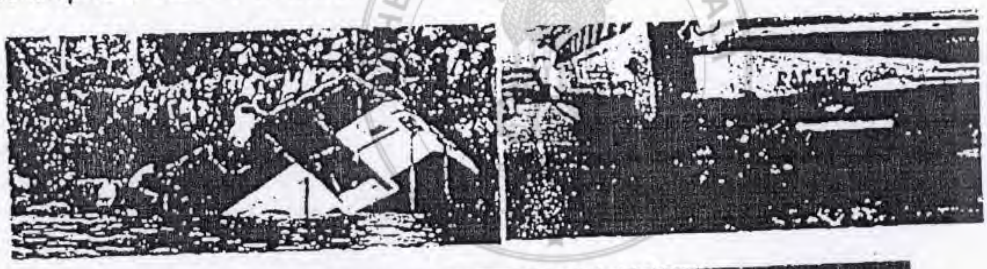
ROAD ACCIDENTS IN KERALA

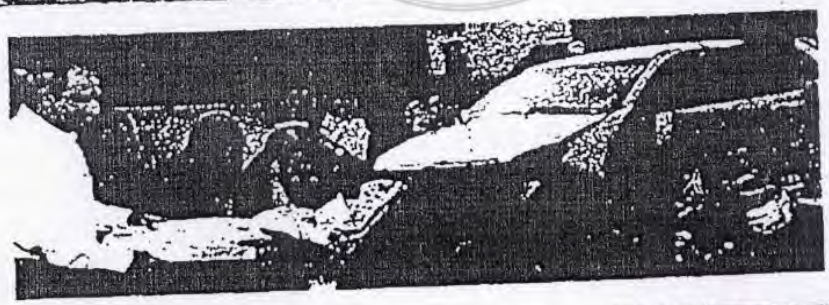
As per the 'ROAD ACCIDENTS IN INDIA 2015' released by the Transport Research Wing of MoRTH, Kerala is in the 5th place in the number of road accidents and in the 4th place in the number of injured in road accidents.

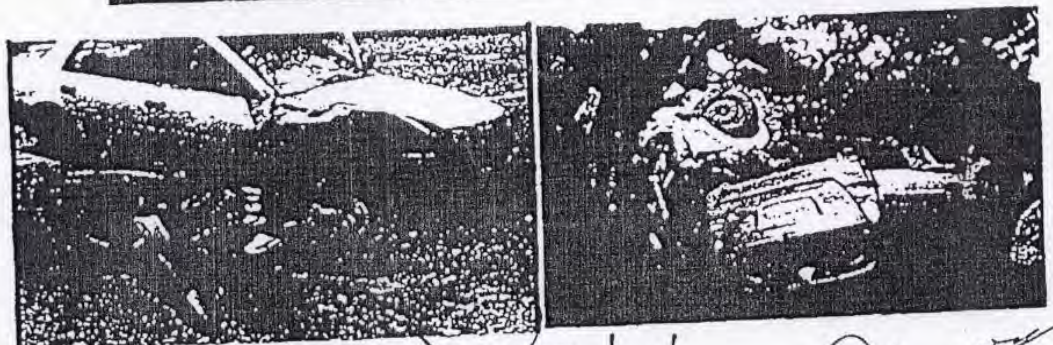
In 2016, 39420 road accidents were registered in Kerala. 4287 precious lives were lost and 44108 people have lost the quality of their lives -either partially or fully -due to major and minor injuries.

To be precise, 12 lives are lost, 121 persons are injured in 108 accidents every day in the state.

This situation does not go well for a state like Kerala; which has achieved high rates of literacy, total fertility, life expectancy, infant mortality and human development index and which is known as GOD'S OWN COUNTRY.







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NECESSITY OF SEPARATE ENFORCEMENT WING

TARGET PROPOSED BY UNITED NATIONS

As per the Decade of Action for Road Safety 2011-2020 declared by UN, the accidents, consequent fatalities and injuries need to be reduced by 50% from that of 2011.

In 2011, the number of road accidents was 35,216 and the number needs to be reduced to 17608 by the year 2020, as per the proposed target. But, instead of decreasing it has increased to 39420 in 2016.

Year	2011	2016	50% Reduction to be achieved by 2020
No. of road accidents	35216	39420	17608
No: of deaths	4145	4287	2072.5
No. of injuries	41379	44108	20689.5

Due to lack of sufficient Enforcement personnel, the Motor Vehicles Department has failed to achieve the desired result in curbing road accidents, and the resultant fatalities and injuries.

TRANS-A3/19/2022-TRANS

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77

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SCOPE OF THE CONTROL ROOM

Apart from ensuring 24 X 7 presences of enforcement officers on the roads, the following activities are also planned to be managed in the well facilitated control rooms.

- 24 X 7 working control room integrated with automated enforcement and surveillance
- All enforcement related works like issue of hearing notice, suspension of driving licenses, permit, prosecution etc ...
- Co-ordination of rescue operation coordinating the service of ambulances, hospitals, police, fire force, vehicle technicians, NGOs and all other concerned.
- Accident Inspection and Cause analysis
- Scientific Study and research on accidents and remedial measures.
- Compulsory correctional classes for offenders.
- Compulsory social service in hospital casualty for the traffic rule offenders.
- Regular Road Safety awareness classes for public and drivers
- Compulsory Road Safety refresher classes at the time of renewal of Driving License.

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803

MVD ENFORCEMENT

Motor Vehicles Department is the Prime Government Department connected with Road Safety. Each and every work related to Motor Vehicles Department - starting from issuance of Driving License to the Enforcement activities- is based on Road Safety only.

The technical officers of the Motor Vehicles Department have a greater responsibility to achieve the targeted area of accident reduction as the road crashes are mainly related with human error in the driving skill.

The Enforcement activities - both automated and manual -by this department have a major role in the reduction of accidents, related fatalities and injuries.

SUPREME COURT COMMITTEE ON ROAD SAFETY

During 2014,the hon'ble Supreme Court has appointed a Committee on Road Safety to monitor the central and state governments on issues pertaining to road safety. The hon'ble Committee has issued several directions to all concerned departments for curbing road accidents and fatalities. One of the directions issued to Motor Vehicles Department is to enforce existing rules strictly, like suspension of Driving License for the offences of over-speeding, over-loading and carrying passengers in goods vehicle, red light jumping, drunken driving, using using mobile phones.

TRANS-A2/19/2022-TRANS

290/2022/TRANS(OS)

78

15

804

78

REDUCTION IN ACCIDENTS AND FATALITIES IN 2017 COMPARED TO 2016

Month	Accidents			Fatalities		
	2016	2017	Reduction%	2016	2017	Reduction %
January	3688	3434	-6.89	432	340	-21.3
February	3384	3157	-6.71	380	326	-14.21
March	3321	3170	-4.55	376	304	-19.15
April	3223	3177	-1.43	381	352	-7.61
May	3385	3480	2.81	405	399	-1.48
June	3160	2920	-7.6	320	302	-5.63
July	3179	3032	-4.62	311	324	4.18
August	3220	3144	-2.36	320	321	0.31
September	3267	3170	-2.94	371	323	-13.48
October	3211	3124	-2.71	350	288	-17.71
TOTAL	33038	31815	-3.7	3646	3277	-10.12

During the past 10 months the accidents are reduced by 3.7% and accident deaths by 10.12%.

The stringent enforcement by the Motor Vehicles Department enforcement officers and subsequent action like suspension of Driving licenses has resulted a reduction in accidents and fatalities during 2017.During the year 2017, so far, the department has suspended 17375 for various traffic offences. These figures can further be improved by strengthening enforcement wing.

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921290/2022/TRANS(OS) TRANS-A2/19/2022-TRANS

805

STRENGTH OF MVD ENFORCEMENT OFFICERS

At present there are only 212 Motor Vehicles Inspectors and 401 Assistant Motor Vehicles Inspectors (total 613)in the whole state for dealing with 1.11 crore vehicles and the related regular service viz. licensing, registration, Certificate of fitness test, accident inspection, route and service verification, check post duties, enforcement work, parallel service checking with KSRTC etc...

The present strength of enforcement officers in Motor Vehicles Department is inadequate to achieve the desired road safety results in view of the road safety challenges including vehicle population, new generation vehicle, lack of road discipline etc....

It may be noted that as per the direction form MoRTH the issuance of certificate of fitness, renewal of registration certificate are performed through the automated system only established by government or pVt parties.

As such time the officers deputed to this purpose will be surplus

It may also noted that Police department also implementing various road safety activities effectively.

It can more ecffectively coordinate various agencies in case of any emergency since it had more

The enforcement department of police also

STAFF STRENGTH IN OTHER SIMILAR DEPARTMENTS

Excise: 4871

Fire and Rescue: 4135

TRANS-A2/19/2022-TRANS

290/2022/TRANS(OS)

79

17

806

7

Forest Department: 6578

Motor Vehicles Department: 2289

It may be noted that, for 3.45 crore human population, there are about 55,000 staff in Police Department while for 1.11 crore vehicle population (1/3rd of human population) there are only 613 enforcement officers in a total staff strength of 2289(756 executive staff + 1533 ministerial and contingent staff).

NEED OF DETACHING THE ENFORCEMENT WING FROM THE OFFICE

Out of the above mentioned 613 officers, 34 Motor Vehicles Inspectors and 68 Assistant Motor Vehicles Inspectors are earmarked solely for enforcement purpose.

Since the work load in every RT / Sub RT office of the department is so heavy, the services of the enforcement staff is often spared for the regular duties in the office which adversely affects the enforcement activities .

COMPARISON OF VEHICLE POPULATION , ENFORCEMENT STAFF STRENGTH AND NO. OF VEHICLES PER ENFORCEMENT OFFICER

Year	No. of vehicles in the state	No. of enft. officers	No. of Vehicles/ Enforcement officer
1980-'81	1.95 lakh	178	1095 : 1
1990-'91	6.47 lakh	268	2418 : 1

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2010-11	66.63 lakh	453	14708 : 1
2016-17	1.11 crore	613	18107 : 1

In the past 36 years, the vehicle population has increased by 57 times and the subsequent revenue collection by 142 times, but the strength of enforcement staff has increased only by 4 times.

ENFORCEMENT OFFICER- VEHICLE RATIO

There is a total of 613 enforcement officers state wide. Of these 511 are engaged in service duties and 102 for enforcement duties in their respective jurisdiction.

The enforcement officer -vehicle ratio of 1:1095 in the year 1980 , has increased to 1:18,107 in 2016.

REVENUE GENERATED BY MOTOR VEHICLES DEPARTMENT

Year	Target fixed by government (in crores)	Total Revenue collection (in crores)
2011-'12	1410.73	1500.91
2012-'13	1726	1831.15
2013-'14	2271.05	2091.77
2014-'15	2742.2	2306.14
2015-'16	2837.35	2575.33

/2022/TRANS(OS)

TRANS-A2/19/2022-TRANS

80

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2016-'17	3247.38	3026.42
2017-'18 (up to October 2017)	3890.64	2119.55

The total revenue collected during 2016-'17 is 3026.42 crores.

The total revenue collected in 2017-'18 (upto October) is 2119.55crores.

INCREASE IN COMPOUNDING FEE COLLECTION ON ENHANCING THE SQUADS

Year	Compounding fee (in crores)	
2011-'12	40.5	Collection by deployment of 17 enforcement squads
2012-'13	43	
13-'14	56.43	
14-'15	81.55	Collection by deployment of 34 enforcement squads
'16	92.1	
17	86.24	

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2017-'18(April to October 2017)	50.85	

By enhancing the number of squads from 17 to 34, there is a substantial increase (from 56 crores to 86 crores)in the revenue collection by way of compounding fee.

PRESENT AND ANTICIPATED REVENUE COLLECTION BY WAY OF COMPOUNDING FEE

AVERAGE COMPOUNDING FEE COLLECTION (last 3 years)	87.71 CRORE	by existing 34 squads (1 team per day)
ANTICIPATED COMPOUNDING FEE COLLECTION	more than 300 CRORE	by proposed 85 squads (3 teams per day)
The anticipated compounding fee collection will increase further by 3-4 times when the new road safety bill comes into force as the penalty rates proposed in it are huge compared to the present rates.		

TRANS-A2/19/2022-TRANS

290/2022/TRANS(OS)

81

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PROPOSAL DETAILS

I)

PROPOSED NUMBER OF ENFORCEMENT SQUADS

Total number of squads required - 85

Present number of squads - 34

Additional new squads to be sanctioned - 51

1	2	3	4
District	Present enforcement squads	New squads proposed	Total squads (2 + 3)
TVM	4	4	8
KLM	3	4	7
PTA	2	3	5
ALP	2	4	6
KTM	2	4	6
IDK	2	4	6
EKM	4	4	8
TSR	3	4	7
PKD	2	4	6
MPM	2	4	6
KKD	4	4	8
WYD	1	2	3
KNR	2	4	6
KSGD	1	2	3
TOTAL	34	51	85

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II)PROPOSED ENFORCEMENT VEHICLES REQUIRED

DESCRIPTION	AVAILABLE	ADDITIONAL REQUIREME
SQUAD VEHICLES	34	51
CONTROL ROOM VEHICLES	NIL	14
TOTAL	34	65

III) STAFF PATTERN AND STRENGTH OF EXISTING 34 SQUADS

DESIGNATION	PER PATROLLING TEAM	FOR 34 SQUADS (ONE TEAM A DAY)
MVI	1	34
AMVI	2	68
DRIVER	1	34
TOTAL	4	136

The existing squad has 1 MVI, 2 AMVIs and 1 driver per squad.

There is only one team working in a single shift per day.

290/2022/TRANS(OS)

TRANS-A2/19/2022-TRANS

82

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IV) PROPOSED STAFF PATTERN AND DETAILS FOR 85 SQUADS

DESIGNATION	PER PATROLLING TEAM	FOR 24 X 7 PATROLLING 3 TEAMS A DAY	FOR TOTAL 85 SQUADS (3 teams a day)	Available in existing 34 Squads	NO. OF NEW POSTS REQUIRED (for 51 squads)
MVI	1	3	255	34	221
AMVI	1	3	255	68	187
Driver cum Road safety warden cum Peon	1	3	255	34	221
TOTAL	3	9	765	136	629

The proposed squad has 1 MVI,1 AMVI and 1 driver per squad.

There will be three shifts of 8 hours each for every squad.

The driver cum road safety warden cum peon is to be posted on daily wages basis.

V) PROPOSED STAFF PATTERN FOR CONTROL ROOM

NUMBER OF CONTROL ROOMS - 14 (one in each district)		
DESIGNATION	PER CONTROL ROOM	FOR 14 CONTROL ROOMS
RTO	1	14
AMVI	3 (1AMVI X 3 shifts a day)	42

JTC &Soc STA

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JTC (E)

17

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Sr. Superintendent	1	14
HA	1	14
LDC	6	84
CONTROL ROOM ASSISTANT	6 (2 Comp.Operators x 3 shifts a day)	84
Driver cum Peon	2 (1 Driver x 2 shifts a day)	28
TOTAL	20	280

VI) DETAILS OF ADDITIONAL PERMANENT POSTS TO BE CREATED

DESIGNATION	TOTAL STRENGTH NEEDED (for control room and 85 squads)	PRESENT STRENGTH FOR 34 SQUADS	ADDITIONAL POSTS
RTO(Enft)	14	4	10
MVI(Enft)	255	34	221
AMVI(Enft)	297 (255 for squads and 42 for Control Room)	68	229
Accounts officer (state Wide)	1	Nil	1
Senior Supdt.	14	Nil	14
HA	14	NIL	14
LDC	84	NIL	84
TOTAL	679	106	573

TRANS-A2/19/2022-TRANS

290/2022/TRANS(OS)

83

25

83 P14

VII) DETAILS OF DAILY WAGES POST

DESIGNATION	Total Strength required	Present Strength for Squads	ADDITIONAL POSTS
Control room assistant (system administrator)	84	Nil	84
Driver cum Road safety warden cum Peon	283 255 for 85 Squads+ 28 for 14 control rooms)	34	249
TOTAL	367	34	333

Total 283 Driver cum Road safety warden cum Peon post needed for squads and control rooms.

34 drivers available in existing squads. So 249 new daily wages posts needed.

FINANCIAL STATEMENT

(A)FOR INFRASTRUCTURE (NON-RECURRING)

ITEM	QTY x PER ITEM COST	ANTICIPATED EXPENDITURE (in Rs.)
CONTROL ROOM	14 x Rs.1 crore	14 crore

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JTC (E)

JTC &Soc STA

19

0/2022/TRANS(OS) TRANS-A2/19/2022-TRANS

815

RADAR fitted interceptors with all necessary road safety equipments viz. Lux meter with printer@ Rs.25,000/- Sound level meter with printer@ Rs.15,000/- Transparency meter with printer @Rs.25,000/- Alko meter @Rs. 45,000/-	65 x Rs.15 lakh	9.75 crore
Surveillance and Automated enforcement Camera (5 lakh /camera) (100 no.s/district)	100 x Rs.5 lakh x 14 districts	70 crore
TOTAL		Rs.93.75 CRORE

(A)Non-recurring expenditure =Rs.93.75 crore

It is proposed that the Non-recurring expenditure of Rs.93.75 crores for infra structure can be met from the funds of Kerala Road Safety Authority. The possibility for PPP /BOO/BOT mode may also be explored.

(B)RECURRING EXPENDITURE

I) Expenditure for permanent staff				
Designation	Present posts	New posts to be created	Additional posts x approximate basic pay x months	Anticipated expenditure for the new posts (in Rs.)
Enforcement RTO	4	10	10 X Rs. 52,000 X 12	6240000
MVI	34	221	221 X Rs. 45,000X 12	119340000
AMVI	68	229	229 X Rs. 37,000 X 12	101676000

TRANS-A2/19/2022-TRANS

290/2022/TRANS(OS)

84

27

816 84

Account officer	nil	1	1 X 48450	581400
Sr. Supdt.	nil	14	14 X 42000 X 12	7056000
HA	nil	14	14 X Rs. 32,000 X 12	5376000
LDC	Nil	84	84 X Rs. 22,000 X 12	22176000
TOTAL	106	573		262445400 (26.24 Cr.)

II) Expenditure on Daily wages staff

	Present posts	New posts to be created	Additional posts x approximate basic pay X months	Anticipated expenditure for the new posts (in Rs.)
Road safety guards cum driver and peon	nil	249	249 X Rs. 600 X 30 X 12	5,37,84,000
Control room assistants	nil	84	84 X Rs. 600 X 30 X 12	1,81,44,000
Total		333		7,19,28,000/- (7.19 Cr)

(B)Total Recurring expenditure

Rs.26.24 crore + Rs.7.19 crore =Rs.33.43 crores

TOTAL ANTICIPATED EXPENDITURE - (A) + (B) = 127.18 CRORE

Over the years, the technology has helped in detecting traffic violations and booking traffic rule violators. The department is committed for the technological advancement in order to achieve more efficiency, transparency and less human interaction to avoid allegations. However, technology has its own limitations in enforcement. Worldwide, technology is mainly used in

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JTC (E)

21

JTC &Soc STA

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enforcement for detecting over-speed, red light jumping, lane violation, etc... But the detection of drunken driving, driving without license, driving by the under-aged, road rages, non-wearing of seat belts, over-load, carrying persons in Goods vehicle, using of mobile phone while driving etc... are beyond the scope of technology and can only be detected through field checking. Therefore, the need for enforcement staff is inevitable.

E1/37/2019-TC Ex1 R1(e)

2806/2019/INWARD TC

Minutes of Meeting

Meeting Chaired by Honorable Minister for Transport, Shri. A K Saseendran on 07th August 2019 at South Conference Hall, Secretariat, Trivandrum

Agenda: Safe Kerala Project presentation by M/s Keltron

Attendees

1. Shri. Shankar Reddy IPS- Road Safety Commissioner
2. Shri. Jyothilal IAS- Principle Secretary and Transport Commissioner in Charge
3. Shri. Rajeev Puthalath- Joint Transport Commissioner
4. Shri. Shibu Itty- Nodal Officer- Safe Kerala Project
5. Shri. Elankovan- Member- Road Safety
6. Shri. Gopakumar- Divisional Head- CPG- Keltron
7. Shri. Binsun N T- Head- Marketing- Keltron

Keltron presented the project in detail regarding the design, implementation and management of the project. Explained in their presentation about how we can reduce the increase in road accidents effectively by implementing advanced technology based automated enforcement management system.

Conclusion:

Asked Keltron to submit a revised techno- commercial project proposal by excluding Ernakulam and Calicut Control Room and Handheld enforcement devices. The State Central Control Room and District Control Room for Trivandrum can be combined together in the same premises.

171/2042

/2019/INWARD TC

Ext R1(f)
E. 01/10/2019 Annexure X1
e-111634/19

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Kerala State Electronic Development Corporation Ltd.

TRANSPORT COMMISSIONER KERALA

An ISO 9001-2015 / IEC 27001-2005/ CMMI3 Certified Govt. Company

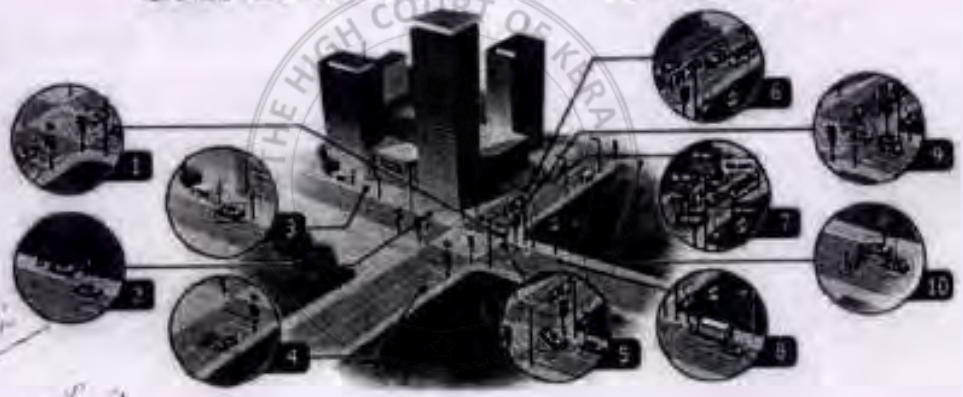
Established: 1973

01 OCT 2019

PROJECT PROPOSAL FOR

ADVANCED AUTOMATED TRAFFIC ENFORCEMENT SYSTEM BASED ON BOOT MODEL FOR 5 YEARS AND FACILITY MANAGEMENT SERVICES FOR 5 YEARS UNDER

SAFE KERALA PROJECT



Submitted to

Motor Vehicle Department

Submitted By

KELTRON COMMUICATION GROUP

Keltron Communication Complex

Monvila, Kulathur (PO), Trivandrum- 695583

Kerala, India

Telephone: 0471 2598948 | FAX: 0471 2598984 | Mobile: 09447210533

www.keltron.org | keltronseu@gmail.com

E1/37/2019-TC

112806/2019/INWARD TC

172/2042

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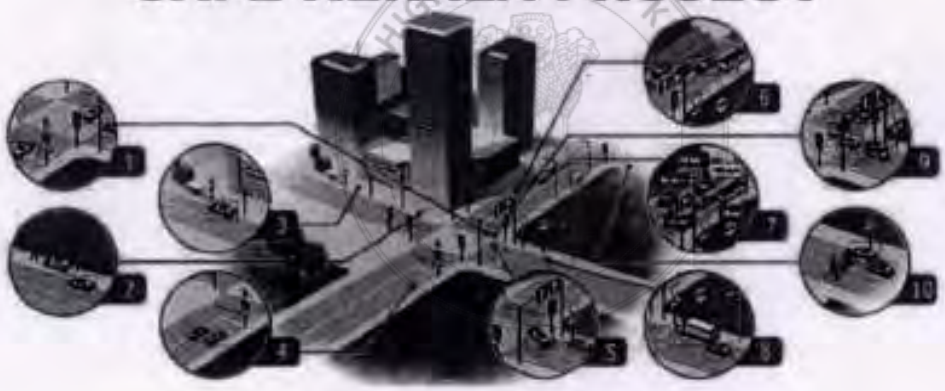

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Monvila, Kulathur (PO), Trivandrum- 695583

Kerala, India

Telephone: 0471 2598948 | FAX: 0471 2598984 | Mobile: 09447210533

www.keltron.org | keltronseu@gmail.com

1

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TABLE OF CONTENTS

E1/37/2019-TC

12806/2019/INWARD TC

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PART A TECHNIAL PROPOSAL

176/2042

112806/2019/INW/ARD TC

E1/37/2019-TC

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LTD.

(A Government of Kerala Undertaking)

KELTRON®
ISO 9001: 2015 CERTIFIED

Communication Project Group
Keltron Communication Complex
Monvila, Kulathoor P.O
Thiruvananthapuram-695 583
KERALA, INDIA

Telephone : 0471-2598948 (5 lines)
Fax : 0471-2598984
E-mail : keltronseu@gmail.com

KCC/SEU/G36/IT/2019-20 **22.08. 2019**

To,

The Transport Commissioner,
Trans Towers, Vazhuthacad,
Thiruvananthapuram, Kerala.

Respected Sir,

Sub: 'SAFE KERALA' Project proposal – Reg
Ref: (1) Technical presentation meeting we had with Hon'ble Minister for Transport
(2) Copy of the minutes of meeting

Based on the presentation meeting we had with Hon' ble Minister for transport on 07.08.2019 at south conference hall- Secretariat, TVPM. The Hon' ble Minister directed to submit a revised Techno-Commercial proposal by

- **Excluding Ernakulam & Calicut Control room.**
- **The State Central Control Room and District Control room for Thiruvananthapuram may be combined together in the same premises.**
- **Exclude the hand held devices proposed for field officers.**

Considering all the recommendations by Hon'ble Minister, Principal Secretary and Road Safety Commissioner we are submitting the detailed techno-commercial project proposal for your consideration.

Thanking you,
Yours faithfully,
FOR KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LTD.

Gopakumar S P
Head – KeltronCommunications Division,
Monvila, KulathurPO,Thiruvananthapuram – 695583
Phone 04712598948Mob. No. 09447210533
Email: spgopan@yahoo.com, :keltronseu@gmail.com

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATIONS DIVISION KULATHOOR TRIVANDRUM-695 583

Copy to
1. P S to Minister for Transport
2. Road Safety Commissioner
3. Principal Secretary – Transport

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1.INTRODUCTION

Cities are becoming populous day by day. There is an ever increasing number of vehicles on the roads, increase in number of offices and public places etc. which in turn contributes to increase in traffic hazards, crowd gatherings, night travel etc. Citizen safety becomes an utmost priority which demands proliferation in efficiency of surveillance systems which could predict occurrences of undesirable incidents, track/ monitor vehicles and people in real time etc., thus improving the quality of life and security of citizens in cities. Considering the requirements, technology integration and a considerable level of automation becomes inevitable for the sustainability and efficiency improvement of the city surveillance system. This could be achieved by inducing artificial intelligence and analytics capability into smart Cameras across the cities, which would provide centralized information in the form of predictive analytics and real time insights to the authorities.

Undisciplined Driving on roads across the state have resulted in major unwanted accidents causing serious injuries and loss of life which is a very major concern for all state authorities. These accidents that has been the major cause for injury and deaths amongst citizens, has prompted the authorities to look for a disciplined motoring awareness among the citizens, for which Traffic Monitoring and Enforcement is a must.

Speed violations, driving two wheelers without Helmet, non-use of Seat Belts while driving four wheelers etc. are another major cause for fatalities and loss of Human Life. Unauthorized parking in no parking zones is another major issue that affects the traffic discipline in any city. Automated speed enforcement systems which are totally free from human interference is an important element in speed control and an effective counter measure to reduce crashes and accidents.

Safe Kerala Project aims to improve traffic safety and traffic rules/law enforcement by harnessing information gathered from Video and other road-safety sensors posted at various intersections throughout the cities. This involves installing, if not present already, and maintaining the heterogeneous camera and sensor network. In many cities, such networks are already installed and have different levels of autonomous decision making, but in most cases, the decision making process is largely human-driven. The data is/will be too voluminous to be handled by humans, so the processes need to be automated as much as possible, to feasibly monitor road traffic patterns, and develop cost-effective and efficient solutions towards road-safety.

Such automation involves the core machine learning, deep learning, computer vision and data analysis problems of converting unstructured video and sensor data to a structured traffic data to further analyse it for various decision making scenarios either by the domain-experts or algorithms.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

ELECTRONICS DEVELOPMENT CORPORATION (KERALA STATE) LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
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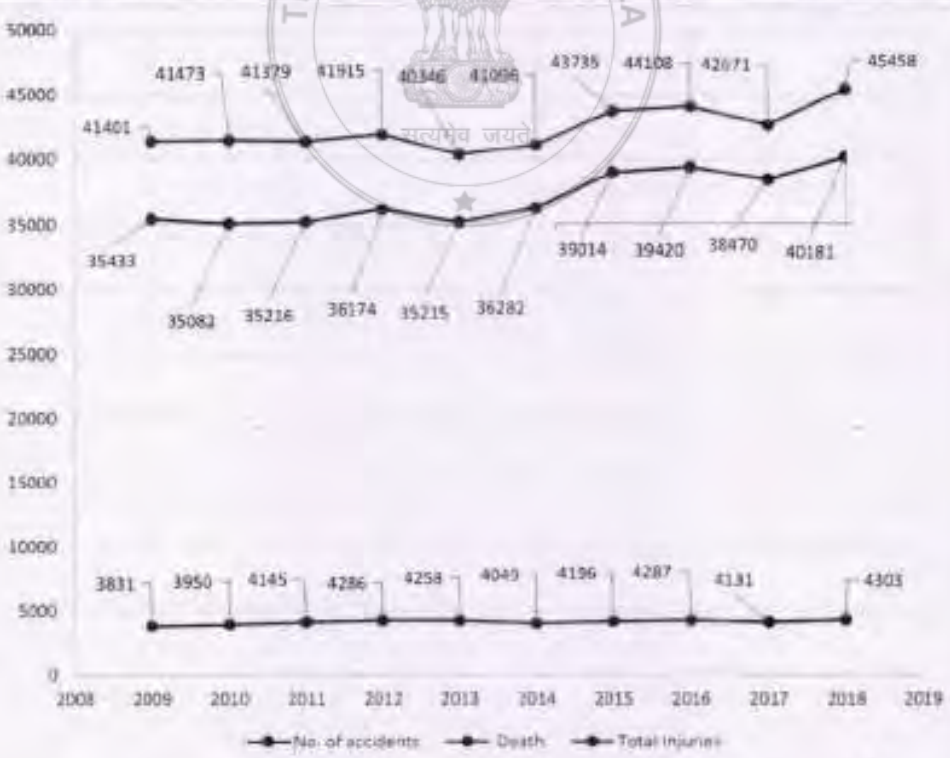
In most cases, the data generated by the citywide networks is unlabeled, so the core problem to address is "identification" (of offences, offending vehicles etc.), so the goal, eventually, boils down to detecting and classifying different vehicles and pedestrians in videos and generating structured data about counts, direction, offences etc.

2. Accident Statistics of Kerala for Last 10 Yrs.

Year	No. of accidents	Death	Total Injuries
2009	35433	3831	41401
2010	35082	3950	41473
2011	35216	4145	41379
2012	36174	4286	41915
2013	35215	4258	40346
2014	36282	4049	41096
2015	39014	4196	43735
2016	39420	4287	44108
2017	38470	4131	42671
2018	40181	4303	45458



GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
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6

E1/37/2019-TC

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3.PROJECT OVERVIEW

Safe Kerala to be implemented in various cities across the state, is a well-planned initiative from the law enforcement authorities and Government that unites, the working class, businesses, city officials, and law enforcement through a project that is intended to maximize safety of the population in all respects and minimize, road accidents, book offenders, and penalize other traffic offences in the total community. By working together to address these issues, the cities under this project will become a safer place to live in all aspects. In order to provide a good quality of living environment for the citizens, a safe city planning must be implemented which includes identification of hot spot accident areas, improvement of physical environment, transport system, enforcement of traffic rules and appropriate surveillance. The proposed project is a 6 year project with 1 Implementation and 5 year Operations and Maintenance.

The project envisages identification of accident hotspots and placing them under coverage with total AI camera based surveillance, deployment of automated number plate reading (ANPR) cameras, and setting up an Integrated Smart Control Room for the purpose of facilitating the project implementation. By choosing a fully digital integrated surveillance system, the law enforcers can view the happenings in the city from the integrated Control Room and take appropriate measures to curb offences and ensure safety of the citizens.

Safe Kerala project for the various cities, leverages partnerships and technical solutions to help reduce accidents, reduce traffic offences, book and tag offenders, and create an environment where people feel safe and secure to live and work.

AI SMART cameras (incident detection cameras) which are deployed in the city roads use Artificial Intelligence (AI) and can help the law enforcing authorities to detect and identify any offence as detailed in the report. These AI based cameras use state of the art deep learning technology to learn and automatically detect various incidents and report the same to the control room. They are also equipped with IR illuminators, for night detection.

These smart cameras also act as high end high speed ANPR cameras for number plate capture as explained later.

3.1. Project Components

1. AI based ANPR Camera System:

The system will analyze the Camera output and detect violations & incidents like seat belt violation, helmet violation, usage of mobile while driving, triple riding, wrong number plate, lane change etc.

[redacted] KUMAR S P
Head CPG
Projects Group, KCC
-695 583

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The identified violations will send to Central Control Room and use this information prepare challan against offenders. The system uses AI based ANPR cameras for violation detection on the field, and only violating vehicle images are captures and send to control room for challan processing and fine collection.

2. **Red Light Violation Detection System (RLVDS):**

The system will identify red light signal violation at Traffic signals and send the court proof images to central control room to prepare court evidence and take further penal action against the offender

3. **Fixed Speed Violation Detection System (SVDS)**

The system is designed detect and record evidence of over speeding vehicles. Unmanned detection is possible for day and night. It consists of a number of ANPR grade cameras installed at the road, on a cantilever / gantry (Capture Point Units) connected to the Central control room.

Vehicle speed is detected by Sensor like 3D Doppler vehicle tracking radar. The sensors can detect any violating vehicles and give capture command to the camera for capturing images of the number plate of the violating vehicle. Single radar is capable of capturing up to 4 lanes.

4. **Mobile Speed violation detection systems**

Vehicle mounted Mobile speed enforcement systems, can be randomly positioned at various roads, to capture all over speeding vehicles. Vehicle speed is detected by Sensor like 3D Doppler vehicle tracking radar. The sensors can detect any violating vehicles and give capture command to the camera for capturing images of the number plate of the violating vehicle

5. **Parking Violation Detection System (PVDS)**

Combination of AI-Smart cameras coupled with associated PTZ cameras can be used for parking violation as described below. Preset Zones can be marked in these PTZ camera images to identify, non-parking areas in a junction. On site vision AI hardware will detect parking violations and these preset View images will be send same to control room. This will result in minimum bandwidth per site.

6. **General Enforcement System using ANPR cameras.**

The system will cross check with the non-compliance of various mandates and statutory payments related to vehicles like road tax, pollution certificate, insurance etc. The penalty challan can be generated against such violations by cross checking respective databases.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manila Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
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KULATHOOR, TRIVANDRUM
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181/2042

E1/37/2019-TC

112806/2019/INWARD TC

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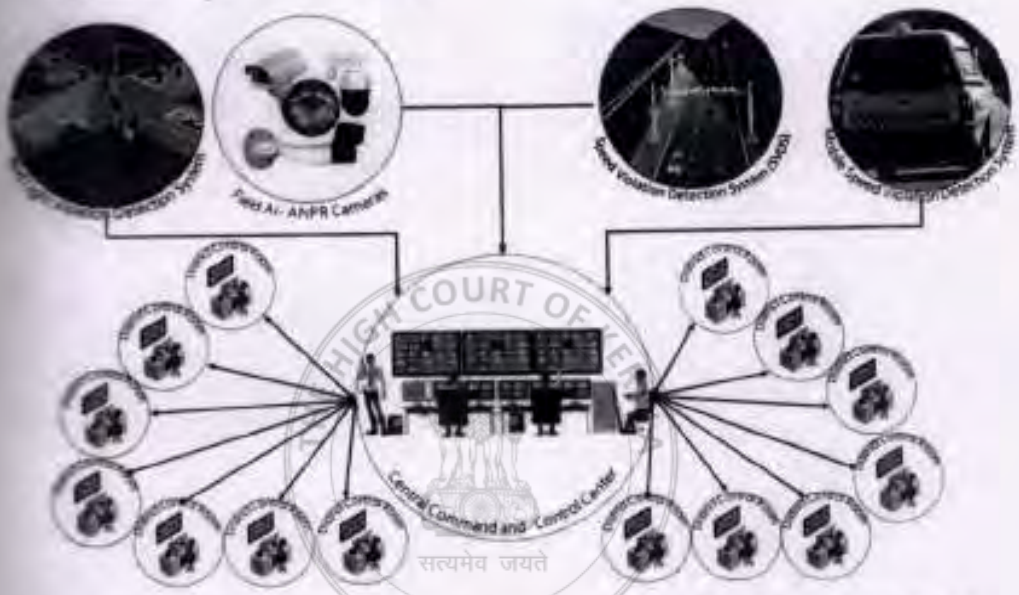
7. Control Room Management and Challan Processing Software

Control Room Management Software is comprehensive application integrated with all filed systems and offices and officers as part of the Safe Kerala Enforcement System. The system will have full configuration and user role rights management capability. The application will handle all evidence data from various field systems like AI based ANPR cameras, RLVDS, SVDS, Mobile SVDS, PVDS etc.

The application will have ANPR processing and Challan processing capability. The application can integrate other systems by using API.

8. State Central control Room (SCCR)



All field systems described above are connected to one State Central Control Room (SCCR). SCCR has required connectivity, servers, storage & firewalls etc. SCCR will receive all violation data from all field units, Do ANPR operation and further processing. & same will be stored in local storages. SCCR will be connected to 14 District Enforcement Control Rooms as in diagram.

9. District Enforcement Control Rooms (DECR)

DECR will receive Violation data from SCCR. DECR will have operators to verify the offences and initiate challan processing, printing, dispatching etc. The facility will be equipped with associated hardware & software applications.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 033

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KILATHOOR, THIVANDRUM
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182/2042

/05/2019/INWARD TC

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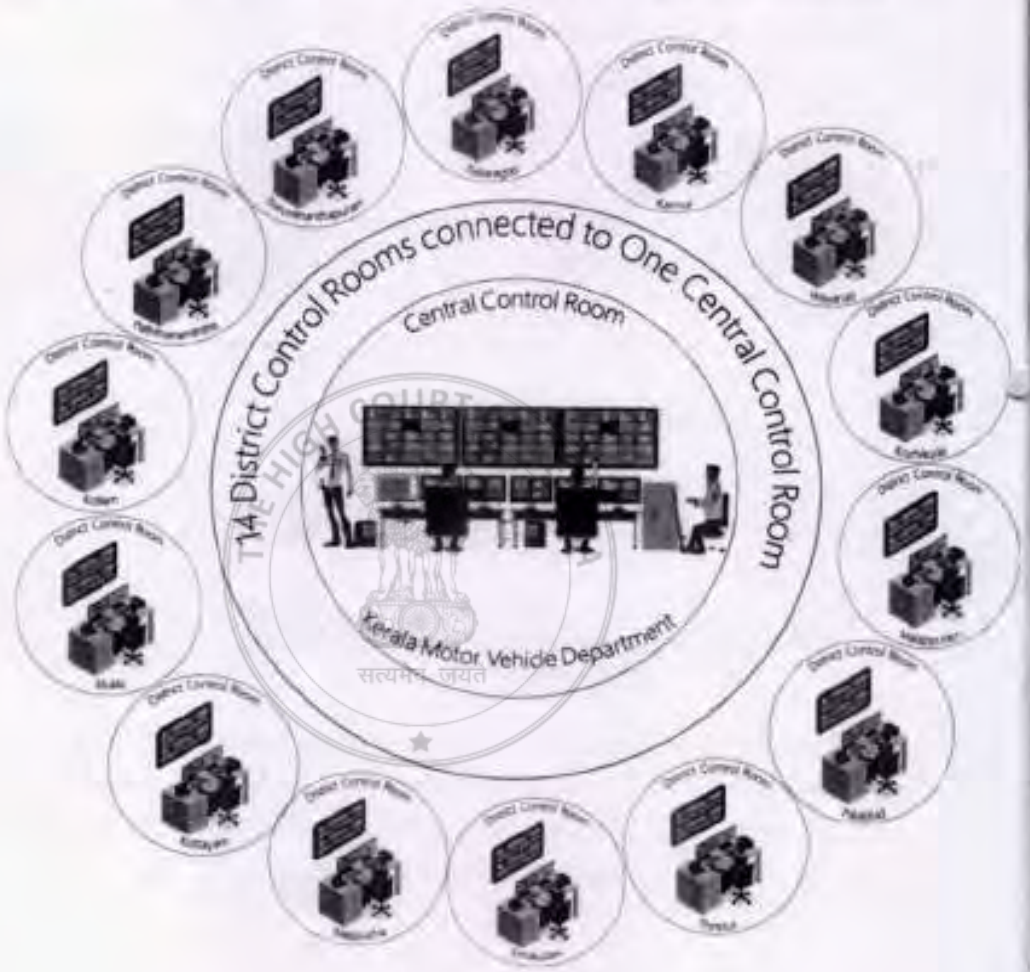
Subsequently dispatched challan data will be pushed to payment management service software application for fine collection by cash payment collection / on line payment collection etc.



3.2. GENERAL VIOLATIONS

List of violations & Incidents

1. Over speeding beyond set limits
2. Red Light Jumping at Signals
3. Helmetless driving
4. Driving without seat belt

GOPAKUMAR S P
Head Of 3
Communication Projects Group, KCC
Momila, Thiruvananthapuram-695 583

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5. Use of Mobile Phones while driving
6. Wrong Entry
7. Illegal Parking
8. Triple riding on two wheelers
9. Vehicles plying without necessary clearances of Pollution etc.
10. Unauthorized vehicles moving on road, in wrong time of the day.
11. Illegal and non-standard number plates

Additional useful information from smart cameras are

- Vehicle crowding, traffic blocks on the roads
- Stopped vehicles on highways (may be due to accidents, breakdown etc.)
- Vehicle classification and counting
- People crowing on roads

3.3. VIOLATION EXAMPLES

1. **Helmet violation**

AI based cameras at site captures images and analyses same for helmet absence detection. Same image also will have vehicle number plate information. Violation data & images are send to CR for further processing.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 567

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
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184/2042

112806/2019/INWARD TC

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HELMET VIOLATION CHALLAN

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL-01-BR-2047	KL01BR 2047	Location -R1	2018-08-28-16-20-13	No Helmet

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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12

112806/2016/INWARD TC

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2. **Seat Belt Violations**

AI based cameras at site captures images and analyses same for seat belt violation detection. Same image also will have vehicle number plate information. Violation data & images are send to CR for further processing

SEAT BELT VIOLATION CHALLAN

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL-20-L-5256	KL 20 L 5256	Location -R1	2018-08-27-17-18-52	No Seat Belt

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kowdiar, Thiruvananthapuram-695 583

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13

F1/37/2019-TC 166/2042

112806/2019/INWARD TC

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SEAT BELT VIOLATION CHALLAN

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL-01-AS-4185	[redacted]	Location-01	2018_10_17-20:52:42	No Seat Belt

3. **Other violations :**

AI based cameras can also detect and classify vehicles moving on road in real time, along with direction. This feature can be used for many type of traffic violation detections. Hence it can detect heavy vehicles moving on road at wrong time of day or wrong lanes. Also wrong way movement of vehicles, non-standard plates etc. can be detected by the AI engine. After a violation detection all Violation data & images are send to CR for further processing

Wrong way violation

Nonstandard plate

GOPAKUMAR S P
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 003

ELECTRONICS DEVELOPMENT CORP. COMMUNICATION DIVISION KULATHOOR, TRIVANDRUM PIN: 695 583 KERALA STATE IT LIMITED

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4. AI - ANPR CAMERA SYSTEMS

AI based ANPR cameras is a combination of Global shutter based state of the art ANPR capable camera, Deep learning based AI processing at edge (using AI Vision processor) and other electronic subsystems, UPS, IR illuminator etc.

We are using advanced technologies like Machine learning, Machine Vision, Artificial Intelligence and Deep Learning to build algorithms and detection models to identify specific violations. Our Visual Processing Units are edge devises equipped with highly optimized detection models and algorithms which can process the frames real-time.

These AI based cameras use state of the art deep learning technology to learn and automatically detect various violations & incidents and report the same to the control room.

4.1. VISUAL PROCESSING UNIT (VPU)

Visual processing Units (VPU) are Low power ARM SoC based industrial compute boards with Graphical Processing Unit (GPU). Visual processing units are interfaced directly to the AI-ANPR cameras.

The VPU will be equipped with Artificial Intelligence/ Machine Learning/ Deep Learning algorithms to analyze the video stream continuously to trace specific type of events. The algorithm in the VPU have trained to identify specific type of suspect events with all supporting data to take further decision. The accuracy of event identification can be improved by using the data which we are capturing from various locations

A 4G module attached along with the VPU board shall provide the band width required for transferring the suspect event to a Central Server.

Figure 1 depicts the high-level data-processing architecture based on the proven big-data paradigm called lambda architecture. Within this architecture, there are several processing pipelines that carry out the various task demanded by a given application for road-transport safety, management and surveillance. Moreover, all such centers are connected to MVD databases for various other tasks, e.g., gathering registration data from such databases for identification tasks following detection tasks.

From the data processing point-of-view, the vision/AI tasks are composed as a data-processing pipeline, wherein each stage of the pipeline executes a low-level task that processes the streams of data. Such a streaming view of data processing is critical to maintain the low-latency, near-real-time nature of the entire solution.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
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188/2042

112806/2019/INWARD TC

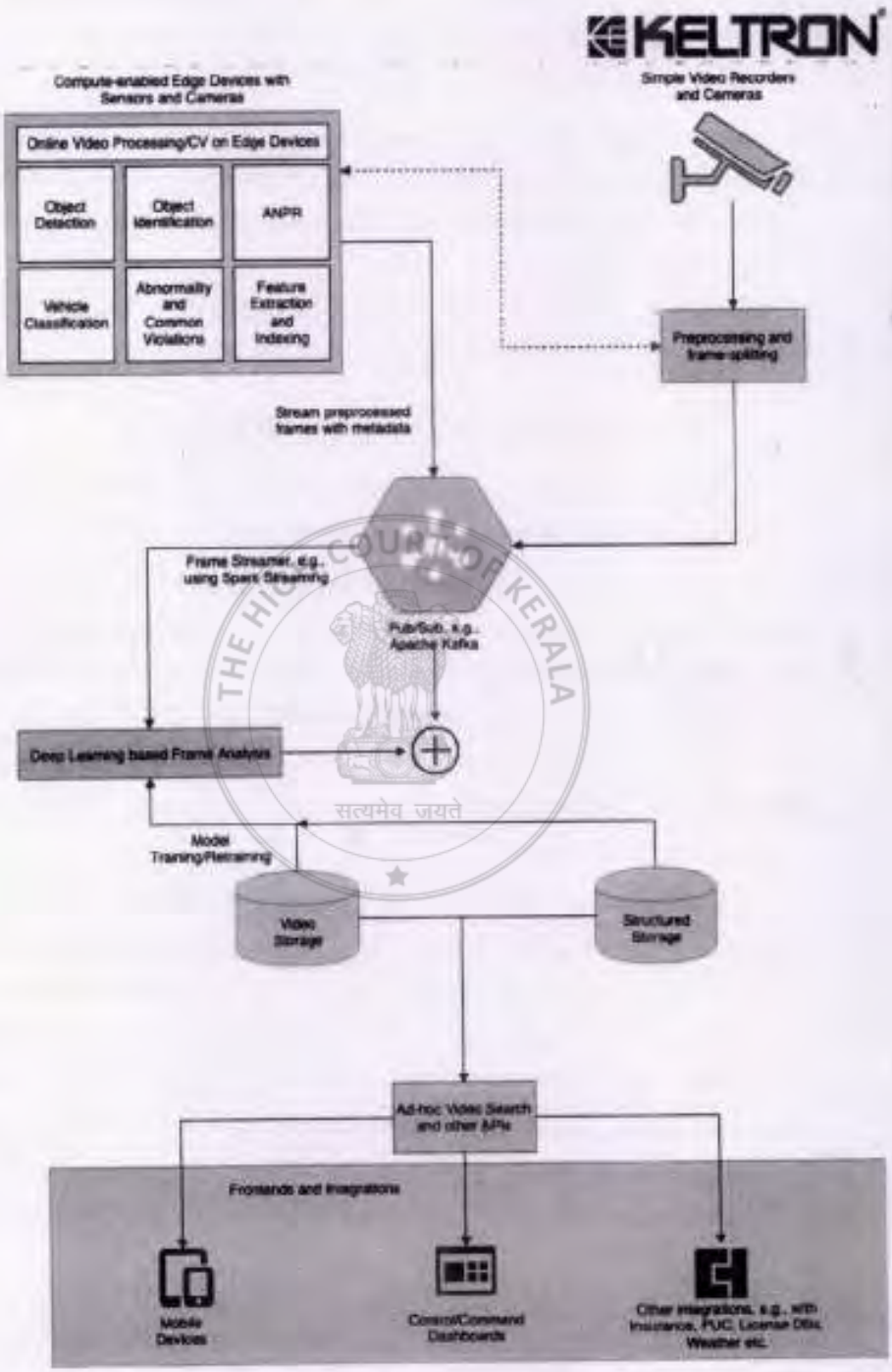

Figure 1. High-level data-ingestion and data-processing architecture

The system consists of several such pipelines for various end-to-end tasks. Some of these pipelines may reside on the edge devices.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC

ELECTRONICS DEVELOPMENT CORPORATION (KERALA STATE) LIMITED
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189/2042

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16

17

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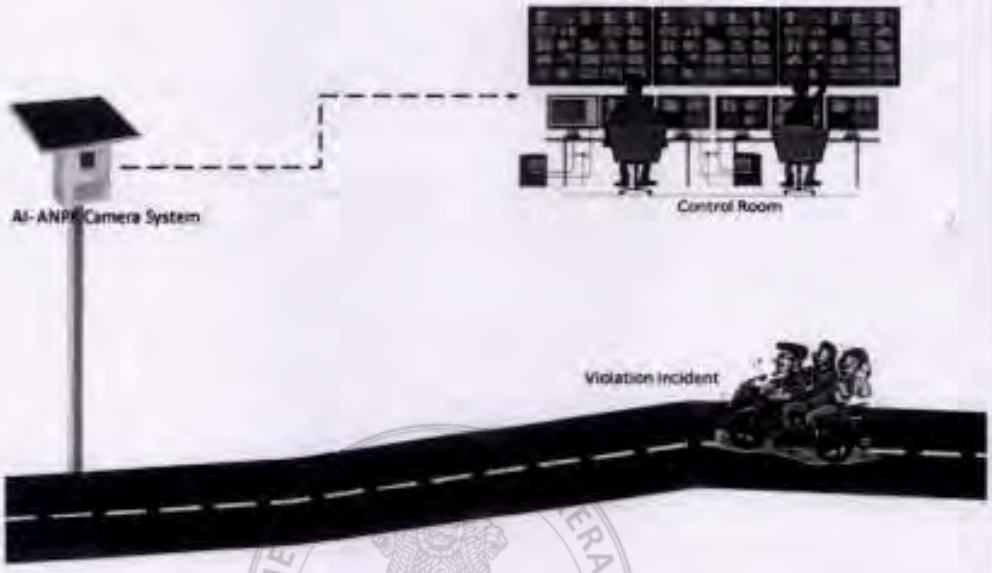

4.2. ANPR CAMERA TECHNOLOGY

The ANPR cameras use the widely acclaimed Global shutter technology compared to the normal rolling shutter technology used for normal cameras which is mandatory for recognizing and capturing the image of speeding vehicles, which normal cameras are unable to capture clearly. These cameras are designed for both day and night conditions without dependence on any ambient light. The high power Synchronized IR flash for night capture is critical to the fast shutter operation of camera.

ANPR cameras are also able to capture "Two wheeler" number plates, apart from the number plates of normal four wheelers, and are capable of capturing both Normal and Retro-reflective number plates deployed in the country. The advanced technology used in our Cameras helps in avoiding vehicle head light blooming while capturing the image from the front side of the vehicle

These systems are designed to provide more than 90% automatic number plate recognition accuracy, with high quality images. These high quality images are helpful to the law enforcing agencies to identify any vehicle for post crime analysis purposes. Pulsed IR flash enables high quality image capture of fast moving vehicles even beyond 200 KMPH at night time and is in synchronization with the high-speed Global shutter camera

Night time Image capture

Pulsed IR flash enables high quality image capture of fast moving vehicles even beyond 150 KMPH at night time. It works synchronously with the high-speed Global shutter camera.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila Thiruvananthapuram 695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LTD
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Advantages

- Crystal clear quality images at night, helmet violation detection, crime analysis, hit-run vehicle identification, seat belt violation
- Ultra-low average (actual) power < 10 W.

General System requirement for ANPR camera

1. **Resolution**

   Greater than 1920 pixels per lane is recommended for capturing Two Wheeler number plates. Also it is possible to provide partial adjacent lane coverage. Hence 2 Mega Pixel camera with motorized zoom recommended

2. **Global shutter technology**

   ANPR cameras use Global shutter technology compared to rolling shutter technology used for normal CCTV cameras (fast moving Fan shown below)

3. **Fast Electronic Shutter**

   Fast electronic shutter (low exposure time < 1mS) is required to capture even vehicles, moving at > 200 KMPH without any image blur

ANPR Camera capture | Normal Camera capture

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 564

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192/2042

019/INWARD TC

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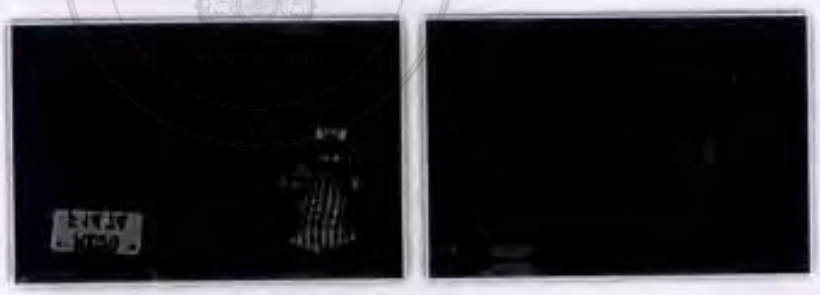
4. **Day and Night Condition**

ANPR cameras should work for Day & Night conditions without depending on any ambient light. Synchronized high power IR flash (> 500 Watt peak power) for night capture mandatory due to fast shutter operation of camera

5. **Two Wheeler Number plate capture**

ANPR cameras are required to capture "Two wheelers" number plate also apart from other vehicles



6. **Normal and Retro-reflective number plate capture**

ANPR camera is required to capture both "Retro reflective" and "Non-reflective" number plates found in India

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manila Thiruvananthapuram 695 583

COMMUNICATION DIVISION
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PIN: 695 583

193/2042

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Significance of high quality vehicle image capture

If some number plates are not automatically recognized, the number plate images should be available for manual recognition. Vehicle identification by image is also important for crime investigation, hit and run vehicle identification, anti-terrorism

4.2.1. AI - ANPR CAMERA SYSTEM SPECIFICATIONS

ANPR Camera Specification	**Resolution: 3, 5 Mega** pixel as per requirement
	Color images for day, monochrome images for night,
	True ICR feature
	CMOS Global shutter sensor
	Exposure time 10uS-maximum 1 millisecond
	Trigger out : Global shutter sync flash strobe out
	Interface: Ethernet, RS 485
	Lux sensor for Exposure control
	Video compression: JPEG
	Sensor: Sony pregius sensor or equivalent,
	Pixel size: 3.45 micron minimum
	Equivalent resolution mega pixel lens
	Vehicle speed up to 200 KMPH
	Frame rate: configurable
	Minimum illumination: zero with synchronized pulsed IR flash
	Capability for radar triggering
	Power 12V DC nominal

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21

194/2042

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IR illuminator Specification	Infrared flash for image capture at night Synchronized flash with global shutter of camera Power in 12V, built in 48 V boost voltage converter Flash strobe input Wavelength: 850nm, FOV: 26 / 36 deg depending on number of lanes Flash power sufficient to capture vehicle images also at night. Capability to capture retro reflective and non-reflective number plates. Peak power up to 300 watts	
AI- Visual Processing Unit Specification	**Description**	**Requirements**
	Processor	At least 64-bit Quad Core, SIMD ISA capable: SSE4+/NEON CPU with operating freq >= 1GHz, (additional good to have: CUDA-based or TPU or Myriad X based dedicated hardware accelerator for vector ops)
	RAM	At least 2GB SRAM (OK, if shared with GPU)
	Networking	802.11b/g/n/ac, dual channel (2.4G, 5G), 10/100 MBPS (Gigabit Ethernet,), 4G LTE hat and SIM Slot
	Storage	On-board flash/eMMC or MicroSD (at least 16 GB in total, MicroSD IO, at least 98mbps)
	USB Ports	At least 2 USB2.0 or USB3.0 ports
	GPU	Must support OpenGL ES 2.0 at least 24 GFLOPS, with at least 1080p30 H.264/MPEG-4 AVC high-profile decoder and encoder
	Additional Storage features	Expandable Storage (through MicroSD / SSD up to 128GB), Anti-tamper with siren shall be part of systems
	OS	Linux

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC

ELECTRONICS DEVELOPMENT CORPORATION (I) LTD
COMMUNICATION DIVISION
KULATHOOR, TRIVANDRUM
PIN: 695 583

2

E1/37/2019-TC

195/2042

112806/2021/INWARD TC

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Solar Power system	**Input**	
	Operating voltage	10vdc-14.8vdc
	Maximum panel connectivity	150watts
	Panel Voc	22vdc max , 10 A max
	Mppt converter efficiency	85-90 %
	Battery	12.8V-30 Ah, Li FE PO4
	Output	
	Output voltage	5.0 & 12 V dc
	Protection	
	Battery over Charge , under voltage, short circuit	Yes
	Backup duration	24 Hours
DC UPS (For Mains powered use cases)	• AC side over, under voltage protection, surge protection • DC power supply - industrial (up to 100W) • DC UPS with 5A charger with Battery protection (over/under) & zero sec change over • output = 10.5-14 VDC: 5V DC out • Battery: 18-40AH	
Enclosure	• Pole mounted outdoor type, with rugged, with Rain canopy etc. All connectors, cables etc. Shall be of industrial grade and any hardware shall be easily replaceable	
Connectivity	• 4G / ADSL / OFC	

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COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM PIN: 695 583

SUJITH KUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

22

23

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5. RED LIGHT VIOLATION DETECTION SYSTEM

Undisciplined driving with scant respect for Signals at intersections is one of the major causes for unwanted accidents and loss of life and destruction of national property across the country. RLVD systems are designed to detect any vehicle crossing the stop line when the signal turns Red.

The RLVD systems employ the latest vision sensor technology to provide a high accurate detail of the vehicle jumping the signal.

The system is designed to detect and record evidence of red light jumping by vehicles at traffic signals. Unmanned detection should be provided for day and night.

It consists of number of ANPR grade cameras installed at the road, on a cantilever / gantry and connected to the Central control room. A junction may require one set of cameras for each road of the intersection. The number of cameras on each road could be increased based on the number of lanes. The rear number plates should be captured by the system, in all cases.

The system at each intersection should be linked to the traffic signal lights. Number plates of vehicles crossing the stop line, during red light should be captured. Video analytics could be used to detect vehicles violating the red signal lights.

One common camera should be used to take wide angled shots of all the lanes along with the traffic signal light post. Minimum one wide angle image showing the vehicle violating red signal and the Red traffic signal together should be captured to act as court evidence.

The road side cameras should also be connected to respective high power infrared flash, for night time capture. The system should also be able to capture clearly both Retro type and Non-retro type number plates which are common in Indian condition.

Most important considerations for RLVDS system are,

- ANPR camera capable of capturing images of vehicles including 2 wheelers, retro – non retro number plate capture at night with infrared high power flash Un-blurred high quality vehicle image and number plate image capture, greater than 1200 pixels per lane resolution, global shutter technology etc.
- Red light jumping, stop line violation sensing for vehicles including 2 wheelers, using vide analytics technology.

Court evidence camera with one wide angle shots showing Red traffic light and vehicle together.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

197/2042

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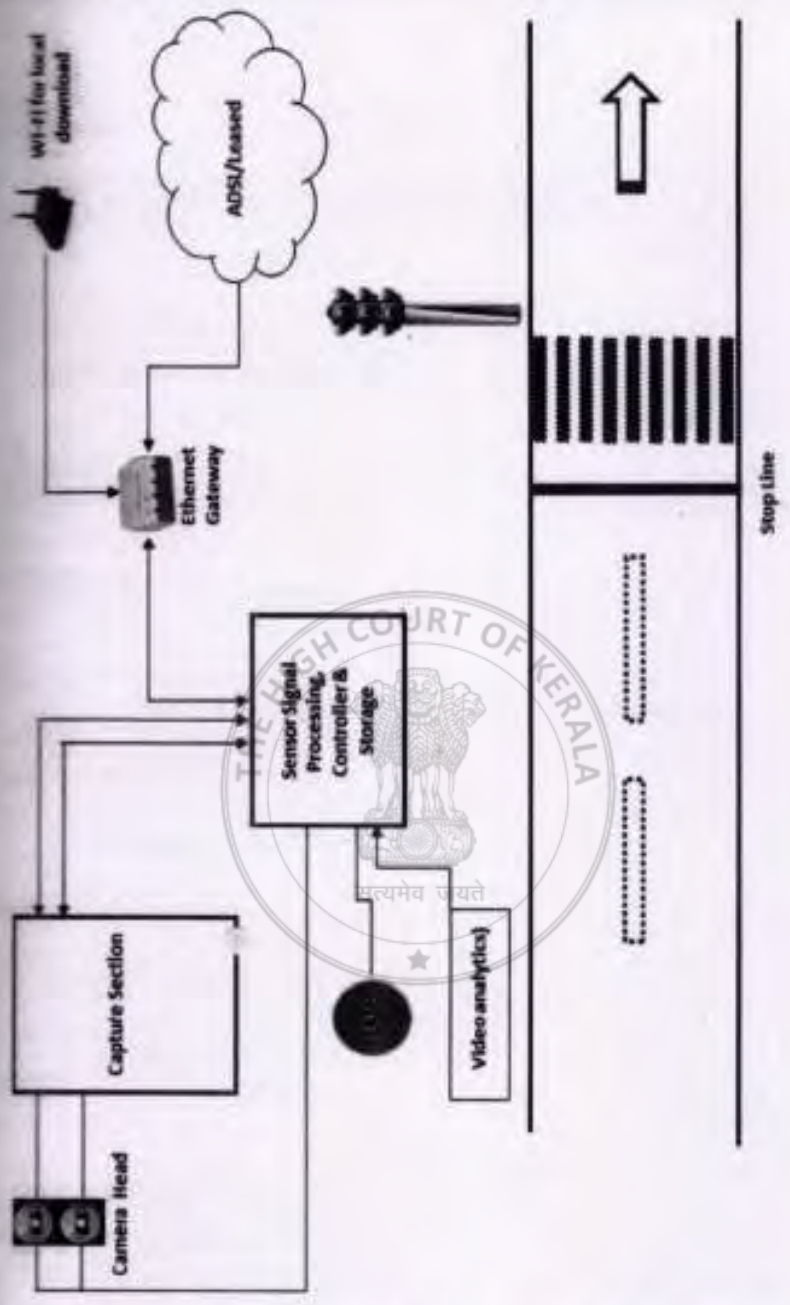
Block Diagram of the RLVDS



Night Time Violation Capture: The system is capable of capturing the "RED traffic light" even when using IR flash at night

DEEPAKKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KELATHOOR, THIRUVANANTHAPURAM
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24

25

196/2042

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5.1. RLVD TECHNICAL SPECIFICATION

Sl. No.	Category	Specification
1.1	Camera for License Plate Capture	ANPR 2 or 5 Mega pixel camera depending on 1 or 2 lanes (True day and night violating RED signal and stop line in day and night conditions. All types of number plates reflective type and standard type should be captured. Vehicle image also should be captured under all conditions. Image compression JPEG. Connectivity Ethernet. Configuration one 2 mega pixel per lane or one 5 mega pixel per 2 lanes can be used.
		True day & night camera
		Color images for day, monochrome images for night
		CMOS Global shutter sensor
		Exposure time maximum 1millisecond
		Interface: 10/100 base T Ethernet
		JPEG compression, Trigger in, Flash strobe out
1.2	Camera for evidence capture	2 Mega pixel camera (True day and night): one per Road to capture in wide angle image of violation with violating vehicle and Traffic signal. Image compression JPEG. Connectivity Ethernet. Should work for day and night condition, acting as court evidence with red traffic light.
		True day & night camera
		Color images for day, monochrome images for night
		CMOS Global shutter sensor

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC

ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
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199/2042

E1/37/2019-TC

112 OUTWARD TC

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		Exposure time maximum 1millisecond
		Interface: 10/100 base T Ethernet
		JPEG compression, Trigger in, Flash strobe out
	Vehicle sensing method	Video analytics, REAR side capture , detection
	Infrared Flash for Illumination	Infrared flash for image capture at night
		Flash power sufficient to capture vehicle images also at night. Should be capable of capturing all types of number plates, including two wheelers at night.
		Capability to capture retro reflective and non-reflective number plates
	ANPR (automatic number plate recognition) accuracy	High ANPR accuracy - > 90% for standard four wheeler number plates at day and night,
	Traffic light interface / visibility	Optically isolated interface. Red signal light should be visible in the evidence camera image along with image of violating vehicle
	RLVDS Configuration	3 Road, 4 Road Junctions with 2 / 3 lanes per road
	Power supply	Power input: 170-240VAC,
		DC - UPS for road side hardware with min 3 Hr back up,
		Utility power supply with power meter required at site meeting State electricity boar requirements)
	Protection	Protection against lightning, under / over voltage should be provided (under these condition operation from Battery power is recommended).
	Camera mounting	Suitable Cantilever / gantry

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, TRIVANDRUM
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27

200/2042

06/2019/INWARD TC

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Sample Challan

ChargeMemo - Red-Light System Violation

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL61BZ4854	[redacted]	PATTOM_RLVDN	2018_09_01_16.02.55	Lane-1

ChargeMemo - Red-Light System Violation

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL61AF7858	[redacted]	PATTOM_RLVDN	2018_09_01_16.06.06	Lane-1

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

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ChargeMemo - Red-Light System Violation

Registered Number	ANPR	Location	Date & Time of Detection	Details
[illegible]	[redacted]	PATTOM_RLVDS	2018_09_01_20.14.32	Lane-1

ChargeMemo - Red-Light System Violation

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL31N4974	[redacted]	PATTOM_RLVDS	2018_09_01_20.08.38	Lane-1

DEEPAKUMAR S P
Head CPG
Communication Projects Group, KEC
Kerala, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
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29

202/2042

E1/3772019-TC

112806/2019/INWARD TC

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6. SPEED VIOLATION DETECTION SYSTEM

The Fixed Speed Violation Detection system (SVDS) should detect and record evidence of over speeding vehicles. Unmanned detection should be provided day and night.

It should consist of a number of ANPR grade cameras installed at the road, on a cantilever / gantry (Capture Point Units) connected to the Central control room. It should be possible for a number of such Capture Point Units to be connected to the same Central control room.

Vehicle speed should be detected by physical Sensors like 3D Doppler vehicle tracking radar. The sensors should detect any violating vehicles and give capture command to the camera for capturing images of the number plate of the violating vehicle. Single radar should be able to capture speed of vehicles on up to 4 lanes.

One common camera per road should be used to take wide angled shots of all the lanes. Two wide angle video shots spaced in time should be taken to prove that the vehicle was moving on the road, for each violation (This is a mandatory requirement for treating the images as Court room proof, to show that the vehicle was speeding on the road). Stretches which have two roads in opposite directions should be covered by two sets of cameras (one for each direction). The number of cameras could be increased based on the number of lanes. Rear number plates should be captured by the system, in all cases.

The road side cameras should also be connected to respective high power Infrared flash, for night time capture. The system should also be able to capture clearly both Retro type and Non-retro type number plates which are common in Indian condition.

The field system should consist of electronics for speed calculation / sensor interface, camera control, control room communication, local storage of violations, Power back up, surge protection, etc. Storage greater than 256 GB should always be provided per road, for buffering violation data, since control room may not be always online.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
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30

203/2042

E1/37/2019-TC

INWARD TC

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6.1.SVDS- TECHNICAL SPECIFICATION

Functional Requirements & specifications	
Doppler Radar (1 per road)	Advanced Tracking Doppler Radar - , Detects and measures speed of vehicles. > 240 Km/hour. Refresh Time – 50msec, Multi lane operation. Speed Accuracy better than 97%. Heavy vehicle classification (trucks / Bus etc.) should be possible by Radar.
Camera for License Capture (1 per lane)	ANPR Camera should be 2 Mega pixel type IP cameras, min HD Mega pixel, True day & night camera Colour images for day, monochrome images for night CMOS Global shutter sensor Exposure time maximum 1millisecond, with motorized zoom lens.
Camera for evidence capture (1 per road)	Evidence Camera (wide angle road view) should be 2 Mega pixel type IP cameras, min HD Mega pixel,, True day & night camera Colour images for day, monochrome images for night CMOS Global shutter sensor, with Lens.
Infrared Flash for illumination (1 per lane)	Infrared flash for image capture at night Synchronized flash with global shutter of camera Wavelength: 850 nm, Flash power sufficient to capture vehicle images also at night. **Capability** to capture retro reflective and non-reflective number plates.
Violation images.	For each speed violation one lane – ANPR image of vehicle with clear number plate images and 2 evidence images should be captured.
Vehicle image Capture	Along with number plate, high quality image of vehicle, also to be captured at Day and Night conditions for all vehicles. Evidence camera should capture wide angle shot of full road and surroundings with minimum two images of vehicle moving on the road.
Speed Enforcement Method	**System should support & enforce both Spot speed and Average speed,** ANPR camera captures vehicle image / License plate number, based on trigger from Radar sensor with time stamp and speed

SP
CPG
Projects Group, KCC
Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KILIMANOOR, THIRUVANANTHAPURAM
PIN: 695 583

31

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	information. Accurate time stamp synchronized with GPS or NTP servers required for Average speed enforcement.
All vehicle – ANPR capture Mode	Captures all vehicles passing through the installed location. All vehicle images and numbers are kept in data base for real time alerts / search for crime analysis. Vehicle images should be captured even if the number plate is not automatically detected ,(example: damaged / unreadable license plates or even absence of number plates)
ANPR accuracy	High ANPR accuracy > 90% all around capability for standard or near standard number plates with maximum 1 character error.
Vehicle detection rate (percentage of vehicles captured), classification, Marking	High vehicle detection rate: greater than 95% of all vehicles captured under all conditions, irrespective of number plate quality, in free flow traffic conditions. Also system should be able to classify different types of vehicles.(min 4 types) Violating vehicle should be marked on the image to distinguish between other vehicles.
Vehicle speed accuracy.	Speed measurement accuracy better than 97%, Speed > 240 KMPH. With national or international metrological calibration certificate for speed sensor.
Road side processing hardware and software, storage, network switch	Road side Embedded hardware, network switch etc. Local storage with 256GB or more storage site. All industrial grade hardware should be provided.
SVDS Configuration	2 lanes per road or as required
Power supply	Mains power with lightning protection, isolation transformer & Energy Meter box
Health Monitoring and control. (from control room),	Temperature, battery status, Power supply working status, vibration sensor **(Anti tamper with siren)** status, Camera status. Remote control of system.
Field Enclosure	Pole mounted outdoor type, with rugged, with Rain canopy etc. All connectors, cables etc. Should be of industrial grade and any hardware should be easily replaceable.
Camera mounting	Suitable Cantilever / Gantry should be provided.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

32

E1/37/2019-TC

112806/2019/INWARD TC

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7. MOBILE SPEED ENFORCEMENT SYST

Standalone fixed speed enforcement systems, even though reduces accidents at t inherent disadvantage. Once the position of systems are identified, drivers has tend speeds at these spots and again speed away.

Mobile speed enforcement systems are usually vehicle mounted and hence can randomly at any point on the roadsides. This has inherent advantage of capturing mo same time ensuring overall speed reduction of vehicles since position of the system drivers. This results in better accident reduction on the roads.

Combining the state-of-the-art modular components, this portable speed enforceme gives you the opportunity, freedom and flexibility to enforce speed limits automaticall for any set speed.

The state of the art Automatic Mobile SVDS, is an ideal solution to this requirement, t capture images and number plates of speed violating vehicles moving in a stretch.

These Speed measurement devices are to be installed on normal vehicles with slight m allows enforcement authorities to measure speeds of vehicles passing the designate enforcement vehicle parked alongside the road. The speed enforcement system w without altering the appearance of the vehicle, thus avoiding recognition.

The unit comprises a 3D Doppler radar capable of tracking two lanes, with an accura speeds of >200 kmph. The infrared Flash unit used can capture images at night and operates on 12 V batteries. These can also be tripod mounted as required.

Features:

- Speed accuracy >97% using 3D Doppler Radar
- Single radar covers up to 2 lane
- International speed calibration certification
- Min 2 Mega pixel high resolution ANPR camera
- Capable to capture both retro & non-retro reflective license plates.
- Marking on image for identification of violated vehicle

3-D Doppler radar Technology

State-of-the-art technology used – better than 97% accuracy (German/US make Rad Federal Institute of Metrology METAS certified")

Capable of tracking multiple vehicles simultaneously

Vehicles moving within the radar lobe are tracked and their movements / speed ana

GOPAKUMAR S P
Senior ...
Communication Projects Group, KCC
Kerala Electronics Development Corporation Limited, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, TRIVANDRUM
PIN: 695 583

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7.1. MOBILE SPEED ENFORCEMENT SYSTEM SPECIFICATION

Sl. No.	Category	Specification
1	Doppler Radar	Advanced Tracking Doppler Radar - , Detects and measures speed of vehicles. > 200 Km/hour. Refresh Time – 50msec, Multi lane operation. Speed Accuracy better than 97%. Heavy vehicle classification (trucks / Bus etc.) should be possible by Radar.
2	Camera for License Plate Capture	Camera minimum 2 Mega pixel total resolution, True day & night camera, min 2 lane coverage
		Color images for day, monochrome images for night
		CMOS Global shutter sensor
		Exposure time maximum 1millisecond
		Interface: 10/100 base T Ethernet
		JPEG compression, Trigger in, Flash strobe out
		Lens: Mega pixel or better, Day & night, IR corrected, lens. Motorized zoom, focus preferred.
3	Infrared Flash for Illumination	Infrared flash for image capture at night
		Synchronized flash with global shutter of camera
		Peak pulse power >400 watts, Average power < 25Watts
		Wavelength: 850 nm, Flash power sufficient to capture vehicle images also at night. 40 deg. angle
		Capability to capture retro reflective and non-reflective number plates.
4	Image brightness, contrast control	The method of gain, exposure control should give optimum image quality under all conditions, 24x7, under all conditions of illumination, independent of road orientation.
9	Vehicle speed accuracy,	Speed measurement accuracy better than 97%, Speed > 200 KMPH. With national or international metrological calibration certificate for speed sensor.
10	Vehicle Marking	The captured vehicle will have marking on image for identification of correct vehicle.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC

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34

E1/37/2019-TC

1125 [illegible] INWARD TC

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	Road side processing hardware and software,	Road side Embedded hardware, Local storage with 240 GB or more storage site. Industrial grade Network switch (0-60 deg. C), 10/100 base T.
	Power supply	Runs on Battery
	Camera mounting	Vehicle mount

MOBILE SVDS-VIOLATION CHALLAN

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL-01-AC-397	[redacted]	Location-R1	2018_10_17-17:23:22	Over Speed

MOBILE SVDS-VIOLATION CHALLAN

Registered Number	ANPR	Location	Date & Time of Detection	Details
KL-01-AX-2894	[redacted]	Location-R1	2018_10_17-17:30:41	Over Speed

DEEPAKUMAR S P
Head CPG
[illegible] Projects Group, KCC
[illegible] Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
PIN: 695 583

35

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8. PARKING VIOLATION DETECTION SYSTEM

Parking Violation Detection System (PVDS) Combination of AI Engine and associated PTZ cameras can be used for parking violation as described below.

- Preset Zones can be marked in these PTZ camera images to identify, non-parking areas in a junction.
- On site vision AI hardware will detect parking violations and these preset View images will be send same to control room. This will result in minimum bandwidth per site.

8.1. TECHNICAL SPECIFICATION OF PVDS

PTZ camera for Parking violation system	Image Sensor	1/1.9" large area progressive scanning CMOS sensor or Better
	Aperture/Focal Length	F1.5~F4.3, f=4.3~129mm / F1.5~F4.8, f=6~180mm
	Optical zoom	30X or Better
	Digital zoom	16X or Better
	Focus	Auto/Manual
	Shutter Speed	Auto, Manual (adjustment range PAL: 1/1 to 1/32000s or Better
	Video compression	H.265, H.264 switchable M-JPEG independent encoding
	Encoding Capability	1080@60fps

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

209/2042

E1/37/2019-TC

1128[illegible]/FORWARD TC

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Alarm Port	2 input, 1relay out
White Balance	Auto/Manual/Outdoor
WDR	Supports multi-frame composite pattern wide dynamic with a range up to 120dB
S/N Ratio	>55dB
Noise Reduction	3D
IR Lamb	Built-in
IR Wavelength	850nm
IR Illumination Distance	100m
Presets	512 or Better
Patterns	12 or Better
Autopans	12 or Better
Tours	16 Groups (each tour can be associated with 14 acts, including preset 1~32, pattern 1~4, autopan 1~4)
Timing Tour	Shall be available
Onvif	ONVIF Profile S
Web Server	Shall be available
Network Port	1 RJ45 10M/100M self-adaptive Ethernet port
Mirroring	Horizontal, vertical
Manual Horizontal Speed	Pan: 0.1°~1000°/s
Preset Speed	400°/s (max.)
Pan Travel	360° continuous
Tilt Travel	0°~180° (auto-flip)
Input Voltage	24VAC/24VDC self-adaptive

[illegible]MAR S P
Head CPG
[illegible] Projects Group, KCC
[illegible]-695 583

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36

37

210/2042

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	Power Consumption at Idle Condition	<17W (max. Idle Condition)
	Power Consumption	<63W (max., heater on, IR lamp manually adjusted to Maximum)
Visual Processing Unit	Hardware Specification	Same as AI – ANPR Camera VPU
	Detection Model and Software License	Parking Violation detection AI model and software license

9. GENERAL ENFORCEMENT MANAGEMENT SYSTEM

Since all above systems captures vehicle number plate information also, other type of violations can also be detected as below.

Since the Control Room software application is integrated with MVD / VAHAN database, it is possible to verify the following type of violations.

a) **Valid Pollution test report**

b) **Valid Insurance**

c) **Tax dues**

d) **Valid permit**

e) **Vehicle type, make etc. corresponds with database information.**

This will be additional revenue for the department.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 563

211/2042

E1/37/2019-TC

112 INWARD TC

KELTRON

CONTROL ROOM MANAGEMENT SOFTWARE

The Central Command and Control Centre shall be the central database of Motor Vehicle Department. across the state of Kerala, there will be more than 1000 units of AI-ANPR Camera with Edge AI devices connected with 4G network and solar power ups. The number of filed devices can be increased further. Camera video stream will be analyzed by Edge AI devices in real time. The system will perform the analysis day and night. Identified incidents will send to central database. The entire incident data processing and enforcement application will be hosted in the Data Centre. Events from each camera location with supporting metadata will come to Central Data Centre with proper indexing. The data base include the evidence against each incident from each camera location.

SCCR functions - SCCR

- All violation data from field hardware (AI- ANPR cameras, RLVD, SVDS etc.) directly downloaded to SCCR servers & storage.
- Any subsequent automatic processing of data like AI & ANPR will be also carried out in central servers.
- SCCR has back up devices, high speed connectivity and power backup suited for 24x7 operation.
- ALL subsystems are designed with 100% redundancy for fail safe, uninterrupted operation.
- Violation data with images available in SCCR can be downloaded by District Enforcement Control Room for verification, printing & dispatching. Processed challan data is pushed back to SCCR for archive and for transferring to payment management software.

DECR functions -DECR

- There will be 14 district enforcement offices across Kerala with client terminals & operators.
- Violation data from SCCR can be downloaded to the client terminals using a web interface.
- Operators perform verification of challans and approving of same with supervision of MVD officials.
- Extracting vehicle owner address from MVD data base also happens in DECR.
- Approved challans are printed and dispatched by email and post. SMS notifications are also sent to violators. It is also possible to get required violation reports.
- Once challans are sent for fine collection, same data is automatically passed to payment management module, for fine collection and accounting.
- Overall operational scheme is presented below

KUMAR S P
Head EPG
Projects Group, KCC
Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
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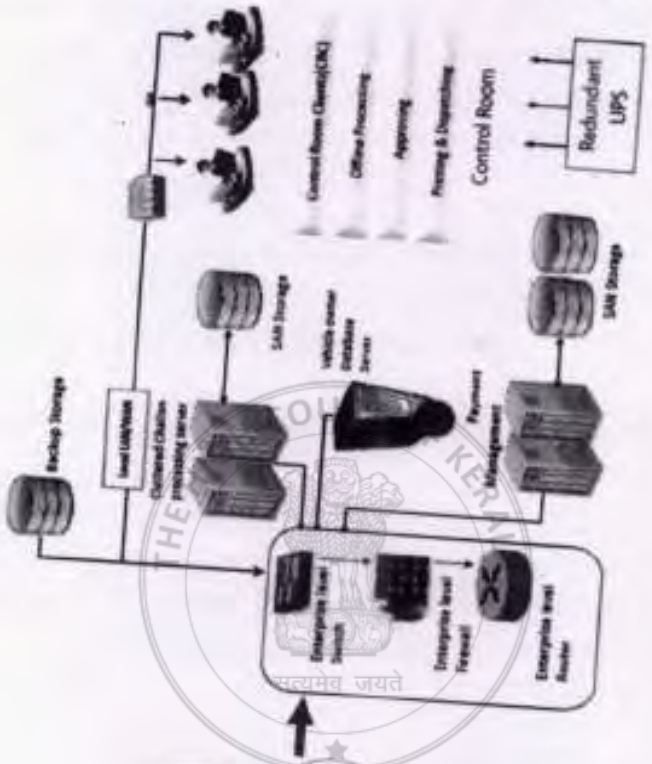
PIN: 695 583

212/2042

E1/37/2019-TC

112806/2019/INWARD TC

KELTRON



GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Mucvila, Thiruvananthapuram-695 583

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E1/37/2019-TC

112806 INWARD TC

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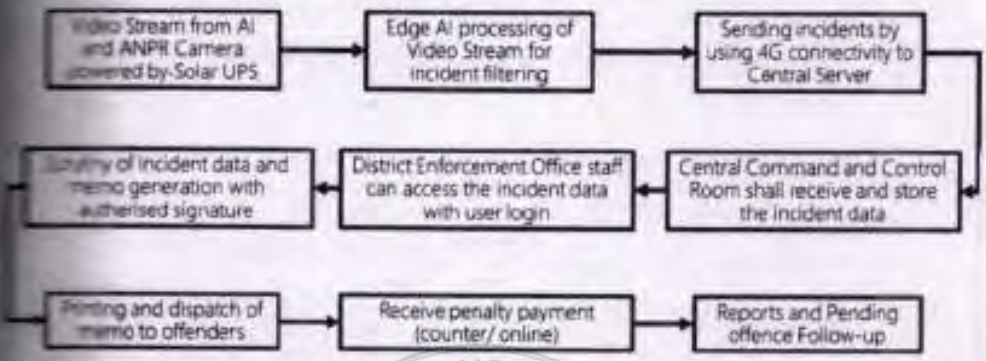
10.1. CHALLAN PROCESSING SOFTWARE

Overall challan processing flow:

Once a traffic violation has occurred, the violation images and data should be sent to control room from the field hardware on the road.

The violation memo / Challan processing software should be capable of preparing the charge memo / Challan and printing the same for dispatching to the vehicle owner.



The Processing of offence challans could be handled by

1. Operator
2. Approving officer
3. Challan dispatch section.

The process flow could be as given below.

Server periodically downloads offence data from the field units as programmed / scheduled. Vehicle numbers from the number plates are extracted automatically by ANPR software. The Operator views them and does any correction if required.

Corresponding to vehicle registration number, vehicle owner data base is required for offence processing, which could be obtained from the motor vehicle department server, with suitable software interface.

At DECR, once challan is ready for approval, and the challans are moved to the server under proper database category. Challans that cannot be processed, can be moved to a rejected database with reasons for the same.

The Officer authorized to approve the challans (using User Name / Password specific to the officer,) views the challans, approves them, and marks them for fine collection. The data goes to 'approved'

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
PIN: 695 583

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category database. (These challans cannot be further modified by any other Operator / person). The Officer can also reject any challan if required).

The Operator prints and issues the authorized challans and takes hard copies as required. He also issues same to offender by email/ post. All issued challans are then moved to server database under Category 'Issued'.

Once challans are issued, the same data is moved to Payment management software / server for payment collection processing.

Possible Offence Details from the violation processing system

Unique ID of Challan , Date and time, Number plate image, (day / night with flash) , Registration number, address of owner, Court evidence images, Location Name and lane number, MVD rules, Fine to be paid, last date etc. any other details of violation, etc.

Functional requirements: Challan Processing software

Sl. No.	Category	Specification
1	Violation memo Format	There will be violation images with evidence images or sequence of images along with violation report. Minimum one image with Vehicle License plate visible clearly. Also should have information like date, time of offence, location ID, Violation ID, speed, Violation details , Motor vehicle applicable Law/ Act, fine amount, due dates, etc.
2	Violation processing Software	Automatic download of captured violations by server software from multiple locations should be possible. There should be Automatic Number Plate recognition by System Software while downloading
		Configure the capture stations – it should be possible to perform Machine ID Settings / Sensor / Flash / Camera Parameters / Date & Time / Connection Parameters / Access Settings, etc. through system software running on the server
		User should be able to use any standard web-browser to access violations downloaded by the server software
		Options for penalizing and dispatching violations should be available. Also, it should be possible for the Megapixel image to be zoomed/ processed by user for creating Challan
		It should be possible for the Challan format to be modified according to the project/ system requirements

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

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		User Management – It should be possible to create Multiple user ID for using the Challan Processing Software and set the privileges.
		It should be possible to get vehicle/owner information from State Motor Vehicle database and embed it into the Challan
		Challan data information should be customizable. Settings should be provided for changing Fine Amount, Header, Footer, Logo, Challan Printing Office etc., for Administrator privilege
		Various reports like Search Vehicle, User's Report, Violation Analysis Report, Dispatch Report, System Events Report etc., should be available

10.2. PAYMENT MANAGEMENT APPLICATION

Payment management system should be a state / city wide web based system that automates the process of fine collection by the Authorized Department, for offences committed by vehicle owners. The server computer should be located at the central control room.

Suitable NIC – Vahan solution can be used as available.

Two modes of fine payments are possible,

- Fine can be collected by designated cash counters at various police stations / offices across the state / city.
- Fine can also be collected by internet electronic payment using debit / credit card or bank transfer & mobile wallets.

Once a traffic violation has occurred, challan is prepared and sent to the vehicle owner, by the Challan processing software as described in section 6.1. Corresponding "Fine payment to be collected information" is subsequently sent to the payment management server running payment management software.

Cash Payment Collection

Cash payment collection could be as follows:

The offender comes to the cash counter of any of the authorized offices in the state and remits the fine with help of a web connected PC linked to central Payment management server. An online receipt is also printed by the central server, once cash has been received.

SP
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
PIN: 695 583

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The total collection received as fine every day is remitted in the bank/treasury by the collecting officer. A Challan number received from bank/treasury for each remittance is entered in to the Payment System software for reconciliation.

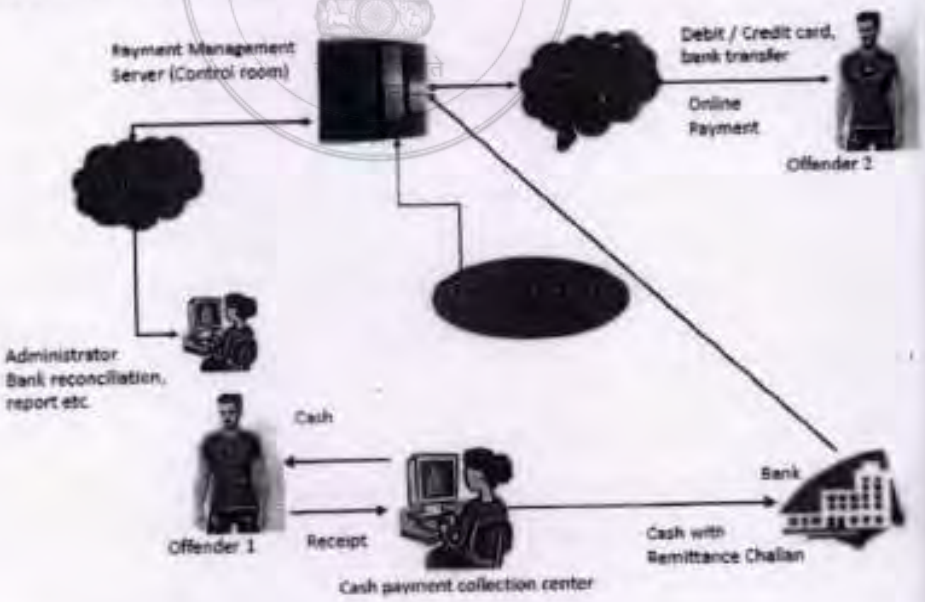
During each fine collection, the details of the driver involved in that particular offence (given by the vehicle owner) are also entered into the Payment System software.

If the offender does not remit the payment in the stipulated time, one or more reminders should be sent to the offender. If he/she still does not pay the fine after a prescribed number of reminders, the case should be recorded as 'Non Remittance'. Such cases are included in the list of offences to be submitted in the court.

Various reports on all the activity like daily collection per office, amount remitted in bank etc. should be available for viewing by the administrator.

Online Payment

There should be a provision for online payment through internet from home using Debit card / credit card payment through a Payment gate way like Bill desk.



In the case of Credit Card or Debit Card payment the Payment Gateway software should act as a middleware connecting the PMWA and the Core Banking software of the bank that issued the offender's Credit or Debit card. In the case of Net Banking also it should act as a middleware between the Core Banking software of the bank in which the offender has account, and PMWA.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

217/2042

E1/37/2019-TC

1120 -2019/INWARD TC

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...tional requirements of Payment management software (PMS)

Sl. No.	Category	Specification
1	Payment Management Software	Web based software application, should include both Cash Counter and Online Payment modes
2	General Requirement:	Should be a highly secured multi-level Authorization and Authentication system
		Should have Data security through Encryption
		Should use Secured Socket Layer for financial data transfer through internet
3	Cash collection management software:	It should be possible for the Administrator to create username and password users with different privileges, and assign type of privileges as required
		It should be possible for the users to manage the system from their terminals using their username and password, according to the powers assigned to them
		It should be possible for the Administrator to back up the data at a particular interval
		It should be possible for the Administrator to get report on cash collected on daily basis for any cash collection location or for all locations
		Data received from challan processing software should include, (XML File).
		1. Unique Chelan id.
		2. Vehicle registration number.
		3. Name of the registered owner.

...KUMAR S P
Head CPG
...ion Projects Group, KCC
..., Thiruvananthapuram-695 583

ELECTRONICS DEVELOPMENT CORPORATION (KERALA STATE) LIMITED
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KULATHOOR, THIRUVANANTHAPURAM PIN: 695 583

45

112 6/2019/INWARD TC

KELTRON

		4. Address of the registered owner.
		5. Location of Offense.
		6. Offense Type and its nature.
		7. Date and time of detection.
		8. MVD Rules.
		9. Fine Amount.
		10. Details regarding violation.
		It should be possible for the Administrator to get reports regarding
		treasury remittance
		It should be possible for the Administrator to get the Statutory reports
		which are to be submitted to the government.(Details after further study)
		It should be possible for the Administrator to get MIS Reports for periodic reviews and for statistical purposes. (Details after further study)
		It should be possible for the Administrator to generate reports of total charge memos received, paid / non – paid cases and send reminders for payment non – collected cases.
		This software should also print receipt for each collection with details as below, Unique Chelan Id, Name of the registered user, Fine Amount, Date of Payment, Mode of

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

1128[illegible]2019/INWARD TC E1/37/2019-TC 219/2042

KELTRON

		Payment, Collecting Officer Id, RT Office Id, Counter No, etc.
		The software should have a facility send reminders (with increased fine) if the payment is not received by the due date
		If the payments are not received after response time mentioned in the final reminder, the offense cases should be forwarded to the court for legal procedures by the authorized person
		On closing the counter, at the end of the day a consolidated list should be generated. The list should contain:
		1. Fine Amount (Daily Summary)
		2. Date and time.
		3. Counter number.
		4. Officer Id.
		5. RT Office Id
		It should be possible for the consolidated list to be verified by a higher officer or the authorized person—from his/her terminal
		The cash (Consolidated amount for a day) collected should be remitted in the bank / treasury and the corresponding "Chelan Id" provided by the treasury should be entered into the PSM by an authorized person thereby closing the account
	Online Payment Mode	A user (offender) should be able to access the page of online payment by simply clicking link in a web Page of

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
[illegible], Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED COMMUNICATION DIVISION KULATHOOR, THIRUVANANTHAPURAM PIN: 695 583

47

112806/2019/INWARD TC

KELTRON

	the govt. department or browsing with web address of the online payment system
	After entering the Vehicle Registration No. and then clicking on a submit button the user should get a list of all Charge memos pending for payment
	He/she should be able to verify the details of all charge memos – Date & Location of violation, fine amount, compound fee(if any), Total, etc.
	He / She can make payment of all or select charge memos
	After selecting the Charge memos which he/she wishes to pay for and clicking the submit button he/she should get the details of each Charge memos which includes –
	i. Date& Time,
	ii. Location of violation,
	iii. Fine amount,
	iv. Compound fee(if any),
	v. Total,
	vi. Grand total of all select charge memos etc.
	On clicking the proceed to payment button another screen should display where he/she would be able to make payment using any one of the following mode of online payments
	i. Credit card
	ii. Debit card

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Momila, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
PIN: 695 583

		iii. Net banking
		The online payment should be done through a third party Payment Gateway (PG). The PG would necessary underground work to fulfil the online payment
		PG would return notifications –whether a transaction had been a success or failure. The DB of PMS should store this notification
		Online payment should be done as per the stipulated guidelines of RBI
		Money should reach the bank account of govt. department within T+ 3 days
		In the case of failed transactions money should be returned to the offender (customer) account within 4 days
		The system should use highly secured data transfer through internet- with SSL technology
		Payment could involve the participation of almost all nationalized and scheduled banks (more than 60 nos)
		It should be possible for the Administrator to generate reports of cash collection of Online payment between 2 given dates
		It should be possible for the Administrator to generate reports of refunded cases (failed) and settled cases (succeeded)
5	Bank Reconciliation	At the end of each day the concerned officer in the bank generates a statement of transactions of the account in

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Vellayambalam, Thiruvananthapuram-695 583

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		which Online payment and Cash Counter payment are remitted
		He/she sends this statement as email attachment to a specified email id of the department
		PMS should periodically check this mail id and on finding the mail it should open it, read contents and store it in its Database
		PMS should make a comparison of records already available in the Database regarding each remittance and should notify discrepancy, if any

11. STATE CENTRAL CONTROL ROOM INFRASTRUCTURE

There will be a state Central Control Room (SCCR). 14 district enforcement offices will connect to central control room server and access offence data for further processing of the offence data, challan generation and despatch. The central Control room server also will receive hit from various RTO and other penalty payment receiving logins also the hit will come from online users who are making penalty payments.

11.1. PROPOSED BOM- SCCR

Sl. No.	Networking	Qty.
1	**Core switch:** 48/52 port 10 G BASE-T/ SFP+/ Converged Modular Switch Full Layer 3 functionality managed switch having minimum 4 QSFP	2
2	Next generation firewall- UTM	2
3	24/28 port GbE Web managed L2 access switch having 4 SFP ports/POE	2
3A	16Gb FC/10GbE 100m SFP+ Transceiver	As required
3B	10G SFP+ Single mode transceivers	As required

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112 INWARD TC

E1/37/2019-TC

223/2042

KELTRON

	SERVER	
	RACK SERVER as per specs attached: Intel family: Latest generation, 64 Bit processor, E5-2690 V4 and above with at least 8 cores and above, minimum 2.1 GHz or above , with 11MB Cache or above, Each with at least 64 GB DDR4 expandable up to 1.5 TB, 3 x 1.2TB SAS 12G Enterprise 10K SFF, storage controller, network adapter, redundant power supply as per specs	14
	Storage The storage array should support industry-leading Operating System platforms including: Windows 2012, HPE-UX, Vmware and Linux. The Storage units: 48TB x 3 B usable Capacity with RAID 1+0 / RAID 6	3
	TAPE DRIVE , BACKUP SERVER AND SOFTWARE	1 set
	Drive Tape Library	1 set
	NAS 48 TB, Giga bit Ethernet & redundant power supply.	1
	DESKTOP COMPUTER	
	Client PC: Desktop Computer, I5, Monitor, HDD, 8GB RAM	8
	ANPR STATION: Desktop Computer I7, Monitor HDD, 16GB RAM, with GPU ANPR work station	10
	Design and documentation, Installation of Server , Storage, Firewall, Router , Desktops, Core switch, Implementation, Data centre build , Civil and electrical work and related documentation, Training , hand-holding and Knowledge transfer, Warranty & Support for 5 years with necessary Manpower support	1
	CONTROL ROOM BUILD UP & INTERIOR	
	Interior Design/ POP, false ceiling , flooring, entire modular furniture, Manager Cabins , officers cabins, Server room integration, Power wiring, UPS wiring, Generator wiring ,Industrial earthling, Networking for entire equipment's, Fire and Smoke detector, IP camera, NVR, Biometric access control and Attendance / Hr management system, Passive cabling ,Backbone connectivity with 10G solution, Rack to Rack connectivity with 10G solution ,MPO cassettes , comfort AC	1

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM

51

806/2019/INWARD TC

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	with automatic change over system,100MBPS Dual leased line connectivity from different ISPs	
12	**PRECISION COOLING SYSTEM AND RACK**	
	COOLING SYSTEM	As per design
13	42/45 U RACK- APW/ RITTAL/VALRACK with high density cable manager, Power distribution Unit and other accessories	As required
	UPS	
14	50 KVA UPS with 30- 60 min back up with MCBs and Accessories –Parallel connection with Hot standby mode.	2
	GENERATOR SET	
15	150 kVA with auto ON and OFF with AMF panel and other Accessories	1
16	**CONTROL ROOM SOFWARE**	
16a.	Violation download server software	As required
16b.	Payment management server software	As required
16c.	ANPR software	As required
16d	Charge memo preparation software(server & Client)	As required
16e	Database suite	As required
16f	HR Management Software	As required

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manula Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORP
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
PIN: 695 583

E1/37/2019-TC

INWARD TC

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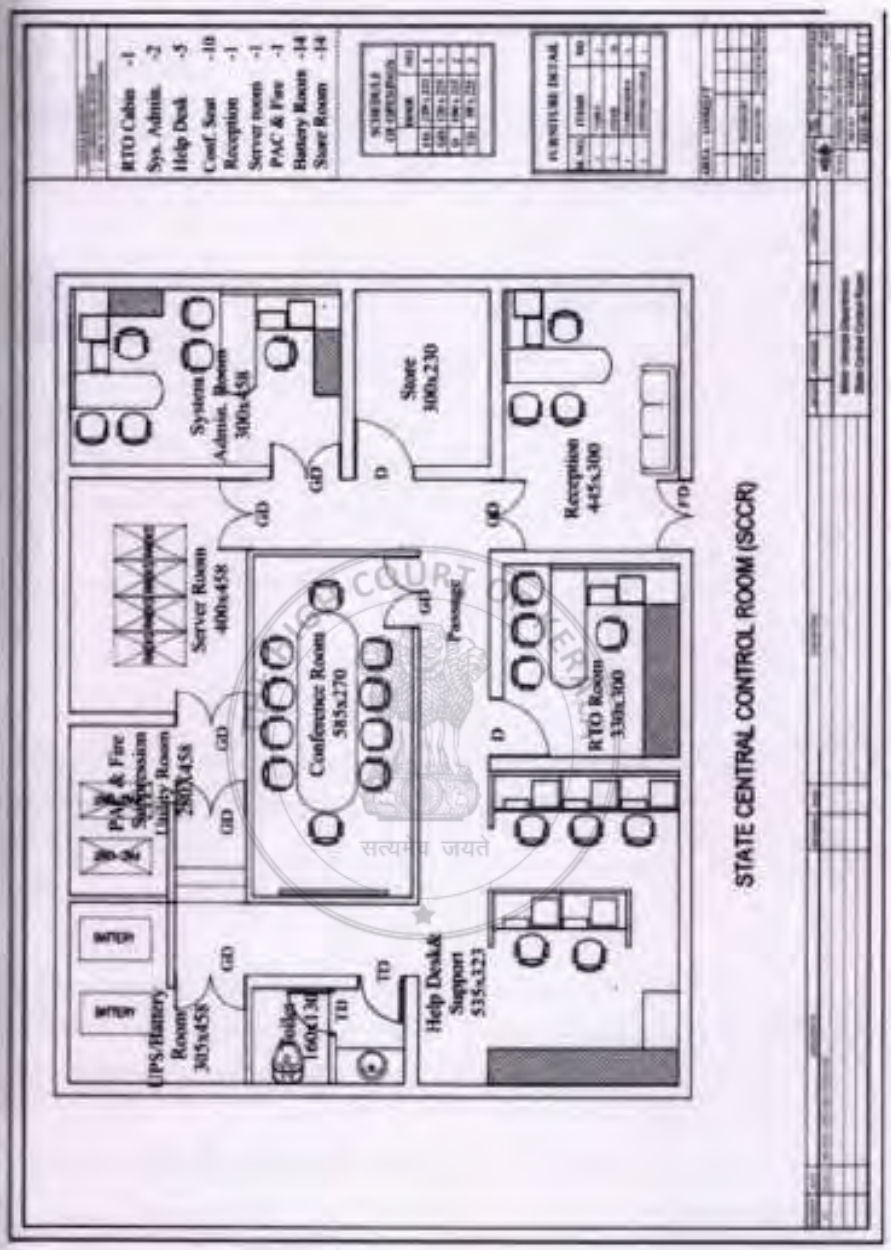
11.2. SCR LAYOUT



GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram 695 583

ELECTRONICS DEVELOPMENT CORPORATION
COMMUNICATION DIVISION
KINATHOOR, TRIVANDRUM
PIN: 695 583

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11.3. TECHNICAL DETAILS OF MAIN HARDWARE COMPONENTS

(OR **equivalent specification devices will be used)**

MINIMUM TECHNICAL SPECIFICATIONS

	RACK SERVER : 14 nos
	Should support Hot Pluggable & Redundant Management
	Modules with onboard KVM functionality.
	Should provide detailed technical information.
	Vendor should be registered in Gartner Leader magic quadrant for Server
	Minimum 1RU rack mounted form factor
Power	Should offer a Dual phase power subsystem
Processor	For each Server:
	a) 2 Socket processor required
	b) Intel family: Latest generation, 64 Bit processor, E5-2690 V4 and above with at least 8 cores and above, minimum 2.1 GHz or above , with 11MB Cache or above
Memory	Each with at least 32 GB DDR4 expandable up to 1.5 TB
Hard disk drive	2 x 1.2TB SAS 12G Enterprise 10K SFF SAS internal Hot swappable HDD in each server. , compatible with OS mentioned under specs, expansion options and matching configuration with infrastructure Minimum 2 I/O slots, with 2 port 8/16 Gb/s Fiber or equivalent channel with RAID 5 installation.
Storage Controller	Integrated PCIe 3.0 based SAS Raid Controller with RAID 5 Support
Networking Interface	Minimum 2x10G interface with SR 10G transceivers and 2x1/10G interface with 1G transceivers
Interfaces	Minimum of 4 * internal USB 3.0 port
Bus Slots	Minimum of 3Nos of PCIe 3.0 based mezzanine slots. One PCIe x16 based and one PCIe x8 based supporting Ethernet, FC adapters, Infini Band and SAS based adaptors

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

ELECTRONICS DEVELOPMENT CORP. COMMUNICATION DIVISION KELATHOOR, TRIVANDRUM PIN: 695 583

227/2042

E1/37/2019-TC

11[illegible]2019/INWARD TC

KELTRON

Graphics Memory capacity	Upto 16 MB
Supply of OS and support	Support of following OS: Win Server 2016 R2 (64 bit) Red Hat Enterprise Linux 6.x (64 bit), Suse Enterprise Linux v11, Oracle *Linux*
Virtualization software and support	The virtualization software shall be licensed for the entire server.
Warranty	5 years
Provisioning	Essential tools, drivers, agents to setup, deploy and maintain the server should be embedded inside the server. There should be a built -in Update manager that can update firmware of system by connecting online.
Remote Management	System remote management should support browser based graphical remote console along with virtual power button, remote boot using USB/ CD/ DVD Drive. It should be capable of offering upgrade of software and patches from a remote client using media/ image/ folder. It should support server power capping and historical reporting and should have support for multifactor authentication. Server should support automated firmware update. Server should support agent less management using the out-of-band remote management port.
	The server should support Active monitoring of System Health and record changes in the server hardware and system configuration. It assists in diagnosing problems and delivering rapid resolution when system failures occur. Should support remote console sharing up to 2 or more users simultaneously during pre-OS and OS runtime operation. Full Remote management should be available over the browser. It should support encrypted Microsoft Terminal Services Integration.
Server management	Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory and HDD. Should support automatic event handling that allows configuring policies to notify failures via e-mail, or SMS gateway or automatic execution of scripts.
	Should support scheduled execution of OS commands, batch files, scripts, and command line apps on remote nodes
	Should be able to perform comprehensive system data collection and enable users to quickly produce detailed reports for managed devices. Should support the reports to be saved in HTML, CSV or XML format.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KDC
Kerala, Thiruvananthapuram-695 583

ELECTRONICS DEVELOPMENT CORPORATION
COMMUNICATION
DIVISION
KULATHOOR, TRIVANDRUM
PIN 695 583

55

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228/2042

E1/37/2019-TC

2806/2019/INWARD TC

KELTRON

	Should help to proactively identify out-of-date BIOS, drivers, and Server Management agents and enable the remote update of system software/ firmware components. The Server Management Software should be of the same brand as of the server supplier.
Administrator Dashboard	Software should support certain kind of dashboard view to quickly scan the managed resources to assess the overall health of the server. The Dashboard should preferably display a health summary of the following:
	Server Profiles
	Server Hardware
	Enclosures
	Logical Interconnects
	Appliance alerts
	The status of each resource should be indicated.
Firmware management	Software should support firmware management for the managed devices centrally by offering baseline firmware version to keep the systems on supported version of firmware.
	Software should maintain firmware repository to download firmware from website and update on managed nodes when required.

STORAGE-	**Functionality QTY – 48TB - 3 nos**
OPERATING SYSTEM & CLUSTERING SUPPORT	- The storage array should support industry-leading Operating System platforms including: *Windows 2012, HPE-UX, VMware and* Linux. - Offered Storage Shall support all above operating systems in Clustering.
CAPACITY & SCALABILITY	- The Storage Array shall be offered with 48TB x3 with RAID 1+0, RAID 6 - For narmoure power saving, Storage narmoure shall be supplied with 2.5" Small form factor SFF drives however storage subsystem shall also support LFF drives with the addition of required disk enclosures. - Storage shall be scalable to minimum of 180 number of drives or greater than 160TB using 900GB SFF SAS drives.
FRONT-END PORTS	- Offered Storage system shall be supplied with minimum of Dual 16Gbps FC ports and Dual 10Gbps ISCSI ports per controller.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Momila, Thiruvananthapuram-695 583

E1/37/2019-TC

2019/INWARD TC

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	- Offered storage shall have flexibility to use all above ports either as FC or ISCSI by replacing the requisite SFP. Vendors shall provide the additional SFP accordingly. In case, vendor doesn't support this feature, then every controller shall be populated upfront with 4 x 16Gbps FC ports and 4 x 10Gbps ISCSI ports.
BACK-END	- Offered Storage subsystem back-end engine shall be running on latest SAS (6Gbps) loop speed.
ARCHITECTURE	- The storage array should support dual, redundant, hot-pluggable, active-active array controllers for high performance and reliability
NO SINGLE POINT OF FAILURE	- Offered Storage Array shall be configurable in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.
DISK DRIVE SUPPORT	- For SFF drives, Offered Storage Array shall support minimum 300/600/900/1200 GB hot-pluggable Enterprise SFF SAS hard drives, 400/800/1600/3200GB SSD along with SAS MDL 1TB / 2TB drives. 2. For LFF drives, offered Storage Array shall support minimum of 4TB / 6TB / 8TB SAS MDL drives. 3. Offered storage array shall also have support for self-encrypted SAS and SAS MDL drives.
CACHE	- Offered Storage Array shall be given with Minimum of 4GB cache per controller in a single unit after removing the operating system overhead. - Cache shall be backed up in case of power failure for indefinite time either using batteries or capacitors or any other equivalent technology. - Offered Storage shall also have optional support for Flash cache using SSD / Flash drives. Offered storage shall support at-least 2TB Flash Cache. - Offered storage shall have at-least 2GB additional cache per controller for Metadata and System OS. Vendor shall clearly provide the document about the overall cache requirement for Metadata and System OS
RAID SUPPORT	- Offered Storage Subsystem shall support Raid 0, 1 , 1+0 and Raid 6 with Dual Parity Protection
POINT IN TIME AND CLONE COPY	- Offered Storage array shall be configured with array based Snapshot and clone narmouredty and shall be configured for minimum of 64 snapshot licenses. - Offered Storage array shall support at-least 512 point in time copies (Snapshots).

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
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57

112806/2019/INWARD TC

KELTRON

REPLICATION	- Offered storage subsystem shall support storage based replication to DR location.
VIRTUALIZATION AND THIN PROVISIONING	- Offered storage shall be offered and configured with virtualization capability so that a given volume can be striped across all spindles of given drive type. - Offered Storage shall be offered and configured with Thin Provisioning capability.
DATA TIERING	- Offered Storage shall also have optional support for Sub-Lun Data tiring in real time fashion across different type of drives within a given pool like SSD, SAS, NL-SAS etc.
GLOBAL AND DEDICATED HOT SPARE	- Offered Storage Array shall support Global hot Spare for offered Disk drives. - At least 2 Global hot spare drive shall be configured for every 30 drives. - Storage subsystem shall also have the flexibility to assign dedicated spare for raid sets.
LOGICAL VOLUME & PERFORMANCE	- Storage Subsystem shall support minimum of 512 Logical Units. Storage Array shall also support creation of more than 100TB volume at controller level. - Offered Storage shall have inbuilt performance management software. Configuration Dashboard shall show overall IOPS and MB/sec performance
LOAD BALANCING & MUTI-PATH	- Multi-path and load balancing software shall be provided, if vendor does not support MPIO narmouredty of Operating system.
Warranty	- 5year Warranty with 24X7,NBD replacement support

TAPE DRIVE & BACKUP SOFTWARE-	**Description of Requirement - QTY – 1 nos**
DRIVE TECHNOLOGY SUPPORTED	- LTO-8 - LTO-7
MAXIMUM NUMBER OF DRIVES	- 2
MAXIMUM CAPACITY	- 720TB (LTO-8, 24 slots)
MAXIMUM DATA TRANSFER	- 2.16 TB/hr (2 LTO-8 drives)
DRIVE INTERFACE	- 8 Gb Native Fibre Channel 6 Gb/sec SAS
FEATURES	- It should have Exceptional storage density 720 TB, 1.44 PB with (2.5:1 compression using LTO-8 tape cartridges.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

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E1/37/2019-TC

2806/2019/INWARD TC

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	- Should be Easy-to-use web-based remote management - It should have Integrated bar code reader - It should have Tool-free tape drive upgrades - Ut should have Leverage tape drives - It should have Customer upgradeable redundant power supply - It should have Multiple interface choices available (FC or SAS) - It should have Removable magazines with user-configurable mail slots - It should be Easy-to-enable AES 256-bit embedded hardware encryption with compression - It should have Extensive OS and software compatibility testing - It should be Proactively monitor utilization, operational performance, and overall life and health of the drives and media with Tape Assure Advanced.
UPPORT AND WARRANTY	- Provides end-to-end management of your backup integration process. - Professional backup and recovery planning that aligns with customer's business needs and implementation that reduces project execution time and risk to the storage environment. -
ATA RATE MATCHING	- It should optimizes performance and maximizes overall efficiency, allowing the drive to respond immediately to any data speed changes from the host. - It should minimizes rewinding and repositioning of the tape, significantly reducing physical wear and increasing reliability. - It should minimizes the power requirements for the drive by reducing the number of repositions
ELIABILITY	- With a rating of 2,000,000 robot load/unload cycles, the Tape Libraries should provide necessary high reliability for today's demanding environment. To improve reliability and longevity, Ultrium products - feature Data Rate (Matching (DRM). This

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

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59

E1/37/2019-TC

112806/2019/INWARD TC

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	allows the tape drive to dynamically and continuously adjust the speed of the drive, to match the speed of the host or network. This increases performance, reduces mechanical wear on the tape drive and extends tape life.
BACKUP	- It should be Fast and reliable backup and recovery - It should meet organization's data protection expectations by reducing the time it takes to back up and recover critical information, apps and servers - Advanced Integration with Vmware and Hyper-V. - It should minimize backup windows, decrease network traffic and reduce disk space required for storing backup data. - It should also reduces the total cost of ownership (TCO) with comprehensive dedupe to cloud that can save storage and infrastructure cost. - It should easily integrated with Vmware, Microsoft and Linux platforms

DESKTOP-	Description of Requirement
PROCESSOR	- Core i5
RAM	- RAM – 8GB, DDR4, 2400MHz
HARD DRIVE	- Min. 320 GB 5400 RPM hard drive
OPERATING SYSTEM	- Windows 8/10
GRAPHICS CARD	- Any with Display Port/HDMI or DVI support
MONITOR	- 23" widescreen LCD with Display Port/HDMI or DVI support
WARRANTY	- 5 year warranty

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

233/2042

E1/37/2019-TC

...019/INWARD TC

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DESKTOP-	ANPR – PC,
PROCESSOR	- Core i5
RAM	- RAM – 8GB, DDR4, 2400MHz
HARD DRIVE	- Min. 320 GB 5400 RPM hard drive
OPERATING SYSTEM	- Windows 8/10
GRAPHICS CARD	- 1050 GTX or better
WARRANTY	- 5 year warranty

CORE SWITCH -	DESCRIPTION OF REQUIREMENT - QTY – 2 NOS
I/O PORTS AND SLOTS	- The above Switch should be scalable to provide 40G SFP+ uplink. - should support combination of converged ports and SFP+/10GBASE-T. - Should have 1 RJ-45 out-of-band management port. - Shall have USB support to copy switch files to/from an USB flash drive
LAYER 3 ROUTING	- Should support both Ipv4 and Ipv6 IP addressing and protocol. - RIPv1 and RIPv2 routing - OSPF (Ipv4) and OSPFv3 (Ipv6) - Border Gateway Protocol (BGP) and Policy-based routing - Shall include Equal-cost Multipath (ECMP) capability - Multicast routing – PIM Sparse and PIM Dense modes - All Features should support day 1 itself
DUAL FLASH IMAGES	- Provides independent primary and secondary operating system files for backup while upgrading - Multiple configuration files to allow multiple configuration files to be stored to a flash image
RESILIENCY	- Hitless patch upgrade. - Ultrafast protocol convergence (<50 ms) with BFD or equivalent.
HIGH-PERFORMANCE SWITCHING	- Switch need to have non-blocking architecture.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kazhakkoottam, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM PIN 695 583

61

E1/37/2019-TC

06/2019/INWARD TC

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REVERSIBLE AIRFLOW	- Enhanced for data center hot-cold aisle deployment with reversible airflow—for either front-to-back or back-to-front airflow
STACKING	- Should support of stacking of switches
JUMBO FRAMES	- Support With frame sizes of up to 10,000 bytes
QUALITY OF SERVICE (QOS)	- Quality of service with advanced traffic management capabilities
PACKET FILTERING AND REMARKING	- Source-port filtering or equivalent feature to allow only specified ports to communicate with each other
TRAFFIC PRIORITIZATION	- Traffic prioritization based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, DiffServ etc
SECURITY	- IEEE 802.1x to provide port-based user authentication with multiple 802.1x authentication sessions per port - Media access control (MAC) authentication to provide simple authentication based on a user's MAC address - Web-based authentication to provide a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant
DYNAMIC ARP PROTECTION	- Dynamic ARP protection blocking ARP broadcasts from unauthorized hosts
POWER SUPPLIES & FAN SLOT	- Should have redundant power supply and fan slots-populated on day 1
PROCESSOR	- Switch should have packet buffer size of 16 MB
MAC-BASED VLAN	- Should support Mac based VLAN
VLAN SUPPORT	- Provides support for 4,096 VLANs
PERFORMANCE	- Support 280K MAC addresses. - Throughput of 1000 Mpps or better. - Routing and Switching capacity of 1400 Gbps or better. - Shall provide Gigabit (1000 Mb) Latency of < 4 µs and 10 Gbps Latency of < 3 µs.
ENVIRONMENT	- Operating temperature 32°F to 113°F (0°C to 45°C) - Operating relative humidity 10% to 90%, noncondensing

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

11 019/INWARD TC

E1/37/2019-TC

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SAFETY & ELECTRICAL CHARACTERISTICS	- Shall support IEEE 802.3az Energy-efficient Ethernet (EEE) to reduce power consumption - Safety and Emission standards including EN 60950; IEC 60950; VCCI Class A; FCC part 15 Class Should support OpenFlow for investment protection and SDN environments.
RADIUS/TACACS+	- RADIUS/TACACS+ for switch security access administration.
WARRANTY & SOFTWARE UPGRADE	- 5Years warranty with advance replacement and next-business-day delivery - Software upgrades/updates shall be included as part of the warranty.
RACK SIZE	- Switch must have 19" 1U form factor.

10G SFP+ SINGLE MODE TRANSCEIVERS	
TRANSMIT POWER	-8.2 to +0.5
RECEIVE POWER	-14.4 to +0.5
CENTRAL WAVELENGTH (NM)	1310
FIBER MODE	SMF
TRANSMISSION DISTANCE	10 km (6.21 miles)

16Gb FC/10GbE 100m SFP+ Transceiver.	
TRANSMITTER POWER (DBM)^3	Maximum -14 Minimum -7.8
RECEIVER POWER (DBM)^3	Maximum -1 Minimum -11
WAVELENGTH	840 to 860 nm
FIBER MODE	MMF
COMMERCIAL TEMPERATURE RANGE	0 to 70ºC (32 to 158ºF)
STORAGE TEMPERATURE RANGE	-40 to 85ºC (-40 to 185ºF)

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
PIN: 695 583

63

236/2042

E1/37/2019-TC

112806

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ITEM – 24/28 PORT GBE WEB MANAGED L2 ACCESS SWITCH WITH 4 SFP PORTS	QTY – 2NOS
MANAGEABILITY	- Switch must have front end console cable.
RACK SIZE	- Switch must have 1U form factor.
PERFORMANCE	- Switch should have packet buffer size of 512 KB. - Support 32K MAC addresses and 4094 VLANs. - Throughput of 40 Mpps or better. - Switching capacity of 55 Gbps or better. Shall provide Gigabit (100 Mb) Latency of < 5 µs and 1Gbps
AUTHENTICATION	- Should support Authentication Flexibility Like: IEEE 802.1X Web based authentication Mac based authentication
LAYER 3 SERVICES	- Should support Dynamic ARP protection, DHCP protection and Secure FTP.
LAYER 3 ROUTING	- Should support Policy based routing support.
ENVIORNMENT	- Operating temperature 32°F to 104°F (0°C to 40°C) - Operating relative humidity 10% to 90%, noncondensing
WARRANTY	- Lifetime warranty.

24/28 PORT GBE ,L2 POE+ ACCESS SWITCH HAVING 4 SFP PORTS-	QTY – 2NOS
MANAGEABILITY	- Switch must have front end console cable.
RACK SIZE	- Switch must have 1U form factor.
PERFORMANCE	- Switch should have packet buffer size of 512 KB. - Support 32K MAC addresses and 4094 VLANs. - Throughput of 40 Mpps or better.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC

COMMUNICATION DIVISION

E1/37/2019-TC

237/2042

INWARD TC

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	- Switching capacity of 55 Gbps or better. - Shall provide Gigabit (100 Mb) Latency of < 5 µs and 1Gbps Latency of < 5 µs
AUTHENTICATION	- Should support Authentication Flexibility Like: IEEE 802.1X Web based authentication Mac based authentication
LAYER 3 SERVICES	- Should support Dynamic ARP protection, DHCP protection and Secure FTP.
LAYER 3 ROUTING	- Should support Policy based routing support.
ENVIRONMENT	- Operating temperature 32°F to 104°F (0°C to 40°C) - Operating relative humidity 10% to 90%, noncondensing
WARRANTY	- Lifetime warranty.

NEXT GENERATION UTM- FIREWALL-	2 NOS
INTERFACES, POWER SUPPLY AND STORAGE	- The appliance shall be supplied with at least 8 nos 10/100/1000 Gigabit ports. - Firewall should have local in-built storage of minimum 200GB SSD. - Firewall should have minimum 8GB memory.
GENERAL FEATURE	- 9 Gbps of firewall throughput - 690 Mbps of NGFW1 - 395 Mbps of Threat Prevention - 150,000 connections per second, 64 byte response. - Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Spyware, URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Maruthi, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, TRIVANDRUM
PIN: 695 583

65

112806/2019/INWARD TC

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	- Firewall must have minimum 500 Mbps of real world multiprotocol throughput including firewall, IPS, application visibility, Anti-Bot, Anti-Spyware, URL Filtering and Advanced Persistent threat Prevention features running at the same time. - Network Security Firewall should support "Stateful" policy inspection technology. It should also have application intelligence for commonly used TCP/IP protocols like telnet, ftp etc. - Appliance should have granular visibility with respect to user and group policy. - The proposed solution shall support DNS proxy. - Proposed solution support Multi Link Management and should support minimum two ISPs. - Should provide clear indications that highlight regulations with serious indications of potential breaches with respect to Access Policies, Intrusion, Malwares, BOT, URL, Applications etc. - Required software license for providing above features shall be included in the solution. - It should be able to scan SSL & TLS traffic.
VPN	- 2.16 Gbps of AES-128 VPN throughput - Firewall should support 3DES/AES IPSEC VPN throughput of at least 300 Mbps. - It should support the Firewall and IPSEC VPN as integrated security functions.
ADMINISTRATION, AUTHENTICATION & GENERAL CONFIGURATION	- The Firewall should support authentication protocols like Active Directory, LDAP and have support for Firewall passwords, token-based products and X.509 digital certificates

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

E1/37/2019-TC

239/2042

INWARD TC

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	and integrate with Windows 2012 Active Directory for user authentication.
IPS	- 1.08 Gbps IPS - The IPS should IPS Engine should support Vulnerability and Exploit signatures, Protocol validation, Anomaly detection, Behaviour-based detection, Multi-element correlation. - IPS should be able to detect and prevent embedded threats with in SSL traffic. - The proposed solution must be able to support DoS protection.
WEB CONTENT AND APPLICATION FILTERING	- Application control must identify applications, its different categories, URLs, HTTPS inspection, Malware content sites, IP and/or user-based policies. - Solution must have a URL categorization and URLs filtering database. The solution should have the capabilities to block, permit, allow & log, protocols other than HTTP, HTTPs, FTP, SFTP. - Should scan outbound URL requests and ensure users do not visit websites that are known to distribute malware.
SECURITY FEATURE	- The solution should also have the scalability to scan & secure SSL encrypted traffic passing through gateway. Should perform inspection to detect & block malicious content downloaded through SSL. - Granularly define exceptions for SSL inspection to protect user privacy and comply with corporate policy. - Solution should have capability to integrate with APT system to detect & Prevent bot outbreaks and APT attacks. - Solution should be able to detect & Prevent the Bot infected machine.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

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67

240/2042

E1/37/2018-TC

112606/2019/INWARD TC

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	- Solution should be able to detect & Prevent Unique communication patterns used by BOTs i.e. Information about Botnet family. - Solution should be able to detect & Prevent attack types i.e., such as spam sending click fraud or self-distribution, that are associated with Bots - The solution should eliminate threats and remove exploitable content, including active content and embedded objects. - The solution should provide the protection from zero-day attacks, known & un-known attacks. - The solution should support detection & prevention of Cryptors & ransom ware and variants (Crypt locker , Crypto Wall etc) through use of static and/or dynamic analysis. - The solution should be able to scan & find for unknown threats in executable, archive files, documents, JAVA and flash like: 7z ,cab,csv,doc,pdf, ppt, pptx, rar, rtf, scr, swf, tar, docx, , jar, xls, , xlsx, zip etc.
MANAGEMENT, LOGGING AND REPORTING	- Upon malicious files detection, a detailed report should be generated for each one of the malicious files. - Firewall central management reporting, logging and narmour solution must be in dedicated appliance foot print. - Centralized Firewall management should be able to manage all functions specified in Firewall, NIPS, AntiBot specification from central console. - Firewall should be able to provide central logging, Analysis and granular reporting. - Management (Management, reporting, analysis) System Support for role-based administration of firewall. - Solution should support analysis of traffic pattern using graphs and charts

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

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UPS 50KVA-	QTY – 2 nos
CAPACITY	50kVA/54kW
QTY	2 nos
TYPE	True Online Double Conversion DSP Based UPS System connected in Parallel Redundant Load Sharing Configuration
PARALLELING	Each UPS unit should have inbuilt Parallel Kit. UPS should be capable of connected in Stand alone Configuration also whenever required
GALVANIC ISOLATION	Inbuilt Isolation Transformer
OVERALL EFFICIENCY	> 94%
INPUT VOLTAGE	400 VAC , 3 phase
INPUT VOLTAGE RANGE	Half Load 208-466 V /Full Load 312-466V
RECTIFIER & INVERTER	IGBT Rectifier & IGBT Inverter
INPUT CURRENT HARMONICS (THDI)	< 3% at full load (without use of any additional filters)
INPUT POWER FACTOR	0.99 or better at full load
INPUT FREQUENCY	45 Hz to 65 Hz
OUTPUT VOLTAGE	400V, 3phase 50Hz. Settable for 380V / 400 V / 415 V AC
OUTPUT VOLTAGE REGULATION	+/- 1% for 100% unbalanced loads
RATED POWER FACTOR	0.9 or better
RECOVERY TIME	</= 20ms (within one cycle) for 100% load change
WAVE FORM	Pure sine wave

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kowdiar, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM PIN: 695 583

69

242/2042

112806/2019/INWARD TC

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OUTPUT DISTORTION	</= 2% for linear load, < 5% for non linear load
OVERLOAD CAPACITY	115% for 10 minutes, 130% for 1 minute
BYPASS	Automatic & Manual Bypass switch facility to be provided
SWITCHGEARS	Inbuilt Input, Output & Battery Isolators
COMMUNICATION SOFTWARE & CONNECTIVITY	SNMP Network monitoring
BATTERY TYPE	Sealed Maintenance Free for 30 Minutes for each UPS
BATTERY MAKE	Amarraja/Panasonic /Exide
BATTERY VAH REQUIRED	54000 per UPS
STANDARDS	EN/IEC 62040-1, EN/IEC 62040-2, EN/IEC 62040-3, IP 20 Enclosure

GENERATOR-	**Description of Requirement - QTY – 1 no**
GENERATOR KVA RATING	- 150/160KVA with AMF control Panel comprising
ENGINE	- diesel engine, water cooled, Stamford or superior make Alternator and potential free contacts and digital out facility and should have all provision for future DG automation without adding any components in the DG set and complete with control Panel, fuel tank of suitable capacity and battery with leads and anti-vibration pads and residential type silencer. The DG set shall conform to detailed specifications attached with this schedule.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram 695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIVANDRUM
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OPERATING CONDITIONS	- The engine alternator shall be capable of working at any ambient temperature between 0 Deg C to 50 Deg C with relative humidity upto 95% condition. - The working KVA rating at site condition after accounting for de-rating shall be obtained at 0.8power factor. - When there is an electrical main supply failure it will be required to work continuously for a period which may even exceed 24hour at a time. - The set shall be capable of taking 10% overload for a period of one hour during every 12hours.
OUTPUT VOLTAGE FREQUENCY AND WAVE FORM	- Nominal output voltage shall be 415Volt with + 1% manual adjustment at all conditions of the load. Frequency shall be 50Hz + 3% Hz in output waveform.
SILENCER	- Residential silencer with approved make/supplied by the engine manufacturer shall be provided. Silencer shall be supported on both ends and located as per engine manufacturer recommendations. Silencer shall be provided outside the canopy. The exhaust system of the generator must not be positioned to make any mark on the fence, containers or tower.
SPEED AND GOVERNING	- The engine shall operate on 1500 RPM, and be able to meet site conditions with regard to Voltage, Speed, Frequency and regulation equipped with governor of required accuracy.

GOPAKUMAR S P
Communication Projects Group, KCC
Kariavila, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, TRIVANDRUM
PIN-695 583

244/2042

112806/2019/INWARD TC

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BATTERY CHARGING	- The battery charging shall be done through alternator and solid state battery charger.
ACCESSORIES	- Heavy duties fly wheel. - Coupling with guard. - Fuel Pump suitable for lifting the fuel from fuel tank provided below E/Asets. - Governor. - Pre filters, Fuel Filter - Pre-filter in lift pump/button filter. - Lubricating oil filter. - Residential exhaust silencer. - Electrical Starter motor - Blower fan. - Charging Alternator. - Digital electronic Governor Stainless steel exhaust flexible coupling - Radiator - Coolant inhibitor - Air Cleaner - All accessories included in the standard set like safeties, solenoid valve etc. shall be got from manufactures as a part of equipment.
INTEGRATED CONTROL SYSTEM	- Microprocessor based generator set monitoring , protection and electronic governing system .The monitoring system should be designed for the genset environment, provides genset protection, engine control and displays genset parameters (both engine & alternator), eliminating use of multiple conventional controls & metering.
AC INSTRUMENTS	- 3-phase AC Amps - 3-phase AC volts - KW - VA - Power factor - Frequency

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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MEASUREMENTS/INSTRUMENTATION	- Lube oil pressure - Coolant temperature - Engine speed - Hours run - Battery voltage
ENGINE PROTECTION	- High coolant temperature (Audio-visual alarm & trip) - Low lube oil pressure (Audio-visual alarm & trip) - Fail to crank (trip) - Fail to start (trip) - Over speed (trip) - Low /High battery voltage (Audio-visual alarm) - Low coolant level shutdown(trip) - Engine shuts down due Charge alternator failure (Audio-visual alarm) - Engine shuts down due to lack of fuel (Audio-visual alarm)
ALTERNATOR	- The alternator shall be shall be self exited, self regulated copper wound and totally enclosed for screen protected class-H insulation, designed and constructed to with stand tropical condition. Voltage regulation shall be + 1%. With digital automatic voltage regulator - The winding shall be star connected and neutral shall be brought out to the terminal box for earth with two independent earths. The terminal of the alternator output shall be enclosed in the terminal box. The AC/ DC wiring shall be separated from each other.

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM PIN: 695 583

248/2042

E1/37/2019-TC

2806/2019/INWARD TC

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11.4. CIVIL WORKS

The proposed data centre shall have non-permissible airtight, thermally insulated and fire rated Partition Walls. Both the real ceiling and real flooring to be leak proof, air tight and thermally insulated. For server room, rigid floor-to-ceiling partition walls having 2-hour fireproof rating are to be considered.

Opening in the walls/partitions at required place shall be provided for Electrical and LAN cabling entry to the server room and then sealed.

Partition with Fire , Moisture Resistant with thermal properties preferably block size of 600 x200 x 200 with cement mortar 1:4 plastering including racking joints curing scaffolding etc.

Partition walls of the Power room shall be built with burnt country bricks and should be plastered well with super plaster / cement mortar12mm thick inside and outside.

False ceiling:

The false ceiling shall be of Aerolite lightweight Calcium Silicate ceilings/Mineral fibreboard modular and grid type (600x600 tiles type), including covering the beams with fire rated board. All the ceiling tiles with grid shall be supported on suitable powder coated galvanized steel/hot dipped galvanized steel white shade suspension as per manufacturer specification. The ceiling shall be provisioned with cut-outs for lighting, Fire detectors, nozzles etc.

Horizontal level False Ceiling grid using hot dipped galvanized steel

Flooring:

The Server room and Power room should have Epoxy access flooring with antistatic properties.

Access floor systems shall conform to EN 12825 standard. The entire access floor system shall be made from Calcium sulphate, Cement and steel, solid fire resistant material to provide adequate fire properties, acoustic barrier and air leakage resistance. The system shall be able to with stand a UDL of 1631kg/Sq.m. point load of 305 kg .The pedestal shall withstand Axial load of 2200kg size. The Ratio of UDL concentrated load should be minimum 5 times.

For server room the under-structure system shall be rigid-grid with 24" (600 mm) Clearance between bottom of tile and top of treated real floor. Assembly shall provide a means of levelling and locking at a selected height. Assembly shall provide 30mm adjustment.

For non-full tiles (cut out tiles): treat / insulate edge with PVC

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

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E1/37/2019-TC

2806/2019/INWARD TC

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The access floor panel shall be laminated with finishes as required and same shall be factory laminated on semiautomatic lamination lines leaving no chance for human error. The finish shall be either High Pressure Laminate/ Antistatic Vinyl flooring of required shade protected on its edges with PVC beading with mitred corners which shall factory fit or integral trim design.

Fire Suppression System

To minimize the risk of damage caused by Fire, an environment Friendly Clean Agent Based Automatic Fire Suppression System has been proposed for the Server Area, Workstation area, UPS Room, Battery Room.

VESDA (Very Early Smoke Detection System)

Early detection of smoke would be the key factor in preventing the fire from developing. The earlier a fire is detected and extinguished, the less damage will be caused. It is an aspirating smoke detection system that provides the earliest possible warning to incipient fires.

Door Access control System

- 300 fingerprints
- 30,000Event buffers
- 1:1 Authentication & 1:N Identification
- Stand-alone/Network communication via RS232/RS485 and TCP/IP
- FX50u Standalone Access
- control system 1:1 Authentication & 1:N Identification
- Standalone/Network communication via RS232/RS485 and TCP/IP
- Up to 3fingerprint templates per registration
- Up to 3 fingerprint templates per registration
- FAR (False Acceptance Rate) with less than 0.0001%
- FRR (False Rejection Rate) with less than 0.1%
- Language Support: English,
- Voltage:3A/12V DC
- Standard Current:50mA
- Operating Current:400mA

GOPAKUMAR S P
Head
Communication Projects Group, KCC
Kerala, Thiruvananthapuram-695 583

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PIN: 695 583

75

248/2042

06/2019/INWARD TC

KELTRON

12. DISTRICT ENFORCEMENT CONTROL ROOM (DECR)

Sl. No.	Districts	MVI& AMVI (Laptop)	Staff (Desktop)	RTO (Laptop)	Firewall	Heavy duty printer	6 KVA Online UPS with 3 hr backup	48 port Gigabit switch	Networking, Electrification	Control room build-up (false ceiling, flooring, lighting, air conditioning, Furniture, cabins)	Estimated Built-up Area (Sq. Ft.)
1	Trivandrum	32	11	1	1	1	1	1	1	1	1460
2	Kollam	28	11	1	1	1	1	1	1	1	1400
3	Pathanamthitta	20	7	1	1	1	1	1	1	1	1200
4	Alappuzha	24	7	1	1	1	1	1	1	1	1400
5	Kottayam	24	8	1	1	1	1	1	1	1	1400
6	Idukki	24	7	1	1	1	1	1	1	1	1400
7	Ernakulam	32	11	1	1	1	1	1	1	1	1460
8	Thrissur	28	11	1	1	1	1	1	1	1	1400
9	Palakkad	24	8	1	1	1	1	1	1	1	1400
10	Malappuram	24	11	1	1	1	1	1	1	1	1400
11	Kozhikode	32	11	1	1	1	1	1	1	1	1460
12	Wayanad	12	6	1	1	1	1	1	1	1	1050
13	Kannur	24	8	1	1	1	1	1	1	1	1400
14	Kasaragod	12	7	1	1	1	1	1	1	1	1050
	Total	340	124	14	14	14	14	14	14	14	

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

KELTRON

12.1. DECR- SUB SYSTEM SPECIFICATIONS

Firewall

IPS Throughput (Mbps)	325
Firewall, 1518 byte UDP packets (Mbps)	2000
VPN, AES-128 Throughput (Mbps)	275
IPsec VPN Tunnels	980
IPS (Mbps)	50
Antivirus (Mbps)	50
Connections per Second	20000
Concurrent Connections	500,000
Firewall Throughput (Mbps)	900
Threat Prevention (Mbps)	100
Security	Firewall, VPN, User Awareness, QoS, Application Control, URL Filtering, IPS, Anti-Bot, Antivirus, Anti-Spam and SandBlast Threat Emulation (sandboxing)
Unicast, Multicast Routing	OSPFv2, BGPv4 and 4++, RIP, PIM (SM, DM, SSM), IGMP
Mobile Access User License	100 in default package, 150 maximum
WAN	1x 10/100/1000Base-T RJ-45 port
DMZ	1x 10/100/1000Base-T RJ-45 port
LAN Switch	6x 10/100/1000Base-T RJ-45 ports
Wi-Fi (optional)	802.11 b/g/n/ac MIMO 3x3

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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PIN 695 583

77

12806/2019/INWARD TC

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Radio Band (association rate)	1 radio band: 2.4Ghz (max 450 Mbps) or 5Ghz (max 1300 Mbps)
Console Port	1x RJ-45, 1x Mini USB
USB Port	1x USB 3.0
3G/4G Modem Support	Yes
DSL (optional)	VDSL: G.993.1 (VDSL), G.993.2 (VDSL2), G.993.5 (VDSL2 Vectoring), G.998.4 (G.INP) VDSL2 profiles: 8a, 8b, 8c, 8d, 12a, 12b, and 17a ADSL: Annex A (POTS), Annex B (ISDN), G.992.1 (ADSL), G.992.3 (ADSL2), G.992.5 (ADSL2+), Annex M (ADSL2/2+) ,Annex L Reach-extended (ADSL2) Dying Gasp, DSL Forum TR-067, TR-100, TR-114 Conformity
Enclosure	Desktop
Operating / Storage	0ºC ~ 40ºC / -45ºC ~ 60ºC (5~95%, non-condensing)
AC Input	110 – 240V, 50 – 60 Hz
Power Supply Rating	12V/3.33A 40W desktop adaptor
Power Consumption (Max)	25W (non-Wi-Fi), 30W (Wi-Fi)
Safety/Emissions/Environment	UL/c-UL, IEC 60950 CB / EMC: EN55022 Class B, FCC: Part 15 Class B / RoHS, REACH, WEEE

Heavy Duty Printer

Print speed black	Normal: Up to 23 ppm
Duty cycle (monthly, A4)	Up to 50,000 pages per month
Print technology	Laser
Print quality	Optical: 600 x 600 dpi
Display	4 Line LCD

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala Thiruvananthapuram-695 583

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PIN: 695 583

251/2042

E1/37/2019-TC

112809/2019/INWARD TC

KELTRON

Processor speed	600 MHz
Connectivity	High speed USB 2.0, Built-in Ethernet 10/100 Base TX networking
Memory	128 MB
Paper handling input	100-sheet multi-purpose tray 1, 250-sheet input tray 2, automatic two-sided printing
Paper handling output	Up to 250 Sheets
Maximum output capacity	Up to 250 Sheets
Duplex printing	Plain, Mid-weight, Light, LaserJet, Colored, Pre-printed, Recycled, Intermediate, Letterhead, Pre-punched, A4, A5, B5(JIS), Letter, Executive, Statement, A3, B4(JIS), B5(JIS), 8K, 16K, 11x17, Legal, Oficio 216x340, Oficio 8.5 x 13 16 x 29 lb, (60 x 110 g)
Power	AC 220 – 240V: 50/60Hz, Normal Operation 550W, Ready 80W, Max/Peak 1.1kWh, Sleep/Power Off 1W/0.2W, TEC 0.998kwh
Power consumption	TEC: 0.998 kWh
Operating temperature range	10 to 30°C

6 KVA Online UPS

Power	6KVA
Input	Single phase & earth ground
Voltage range	184 – 288VAC @ 100% load
Frequency	40 – 70 Hz
Output system	Single phase & earth ground

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kanaka, Thiruvananthapuram-695 583

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PIN 695 583

79

12806/2019/INWARD TC

KELTRON

Output voltage	208V/220V/230V/240V settable
Output waveform	Pure sine wave
Output frequency	50Hz +/- 0.02% (free running)
Voltage regulation	+/- 1%
Battery Charging current	1-5A adjustable
Charger type	Constant voltage constant current
Overall efficiency @ full load	94%
Inverter efficiency @ full load	93%
Manual bypass	Optional
Protection	Short circuit, input over and under voltage, overcharging of battery, output over and under voltage
Audible alarm	Battery low, mains failure, over temperature, inverter overload, fan failure
Enclosure grade of protection	IP 20
Operating temperature	0 – 40 deg

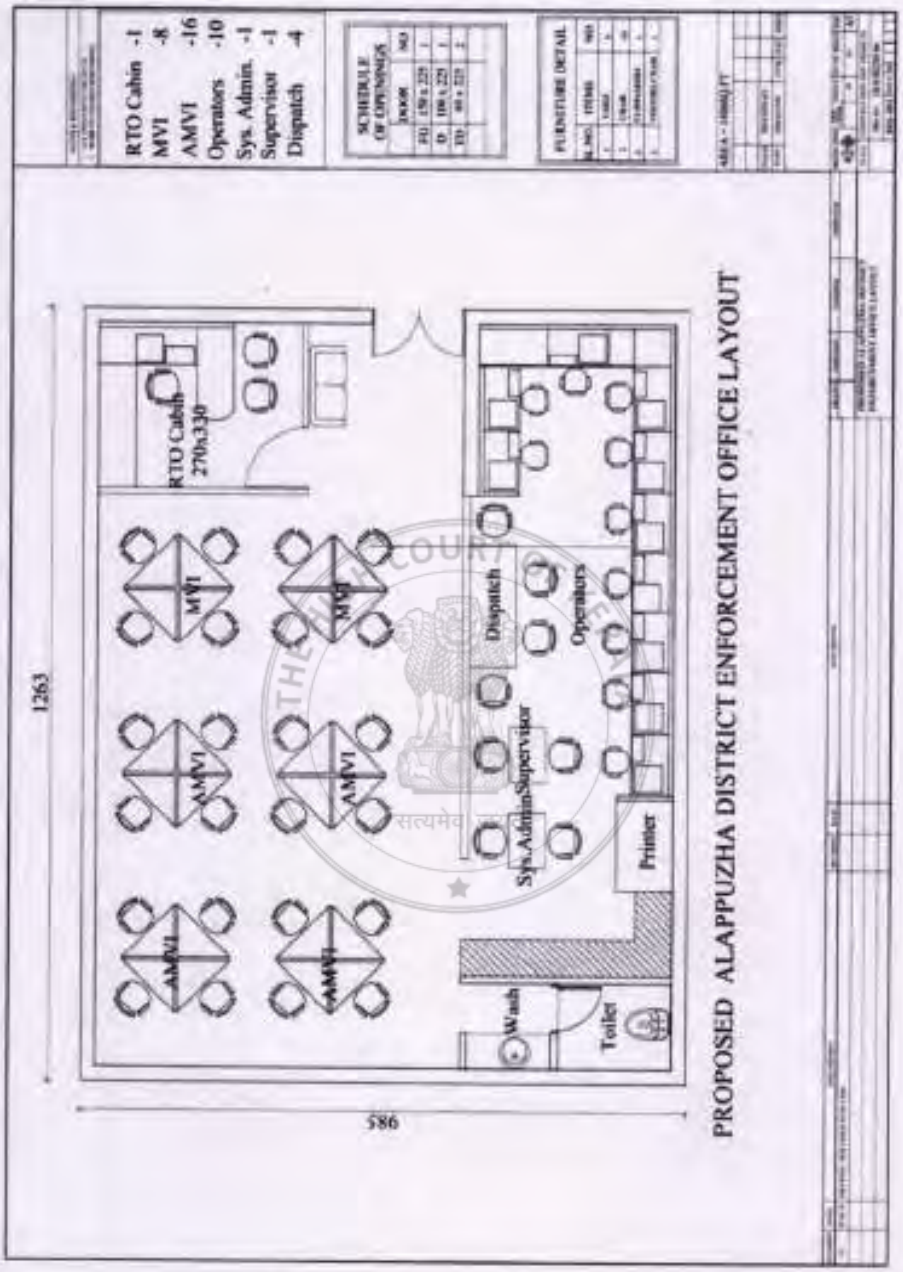
GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

E1/37/2019-TC

2019/INWARD TC

KELTRON

12.2. DECR- LAYOUT



GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kazhakuttom, Thiruvananthapuram-695 583

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COMMUNICATION DIVISION
KAZHAKOOTTOM, THIRUVANANTHAPURAM
PIN- 695 583

81

254/2042

112806/2019/INWARD TC

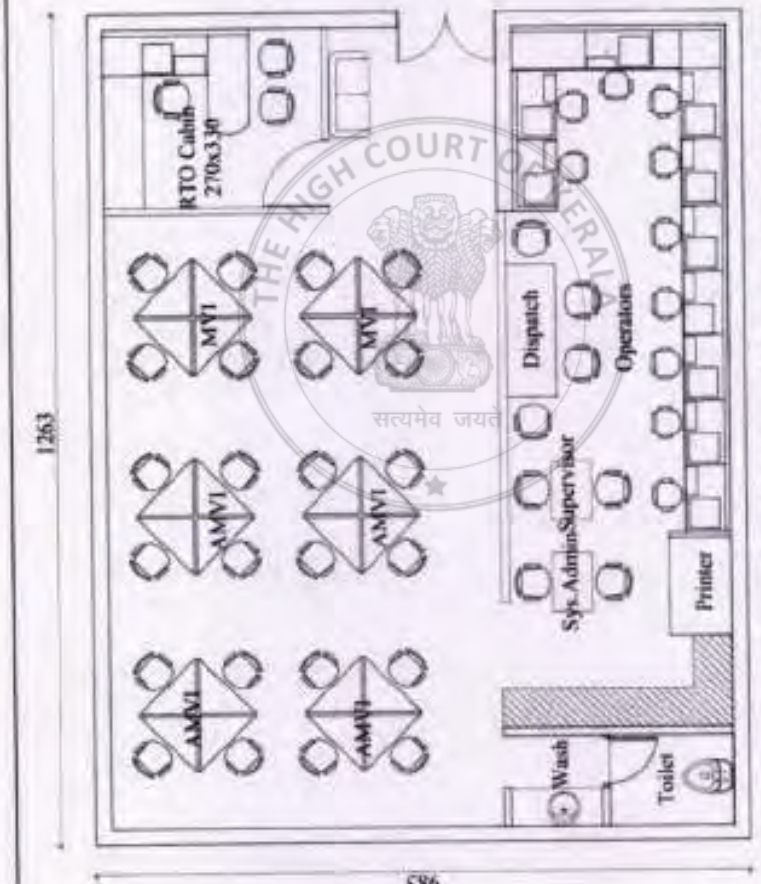
KELTRON

RTO Cabin -1
MVI -8
AMVI -16
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -4

SCHEDULE OF OPENINGS

FURNITURE DETAIL

AREA - 1600SQFT



PROPOSED IDUKKI DISTRICT ENFORCEMENT OFFICE LAYOUT

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Head CPG
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255/2042

E1/37/2019-TC

06/2019/INWARD TC

KELTRON

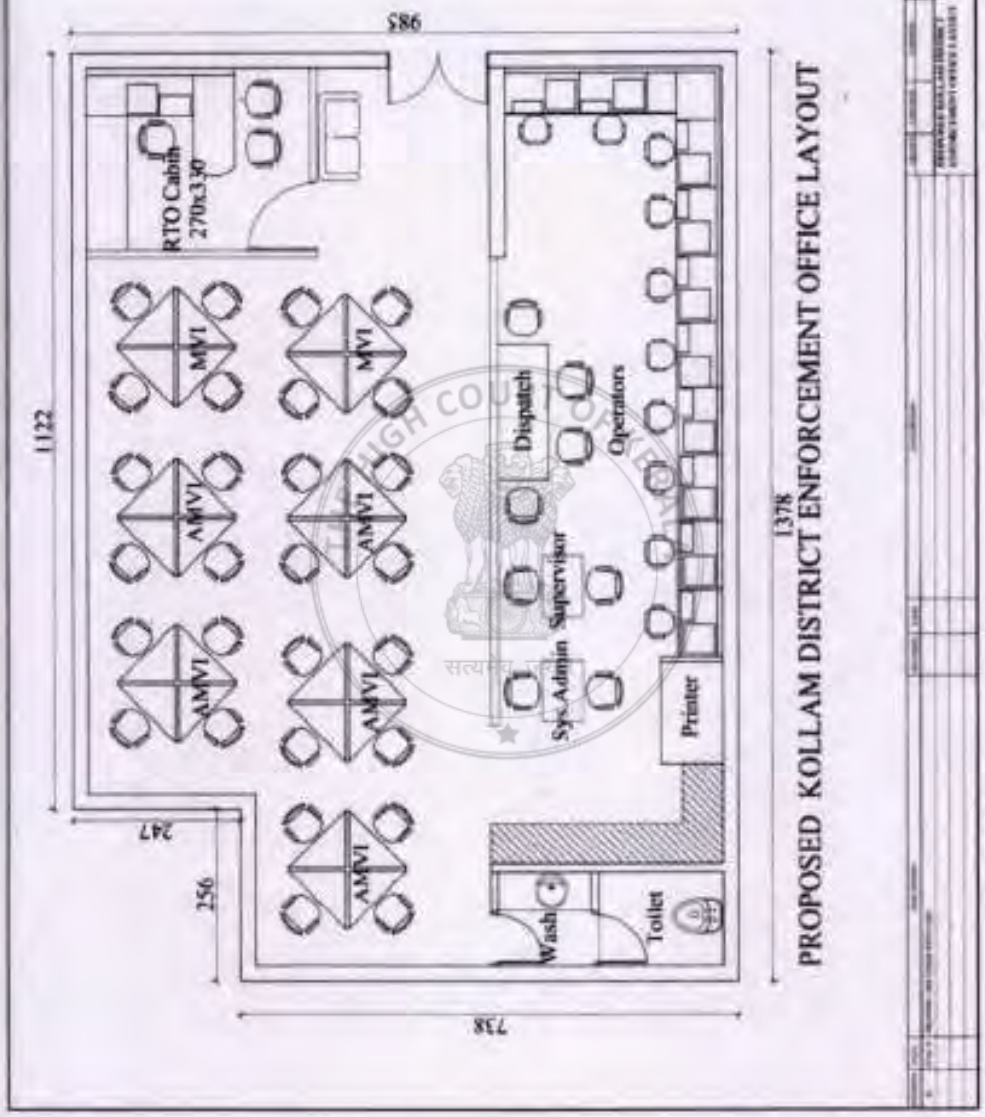
RTO Cabin	-1
MVI	-8
AMVI	-20
Operators	-10
Sys. Admin.	-1
Supervisor	-1
Dispatch	-4

SCHEDULE OF OPENINGS

	DOOR	NO
FD	150 x 225	1
D	100 x 225	1
TD	80 x 225	2

FURNITURE DETAIL

SL NO	ITEMS	NO
1	TABLE	4
2	CHAIR	4
3	CUPBOARD	1
4	TUBELIGHT	4



GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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KULATHOOR

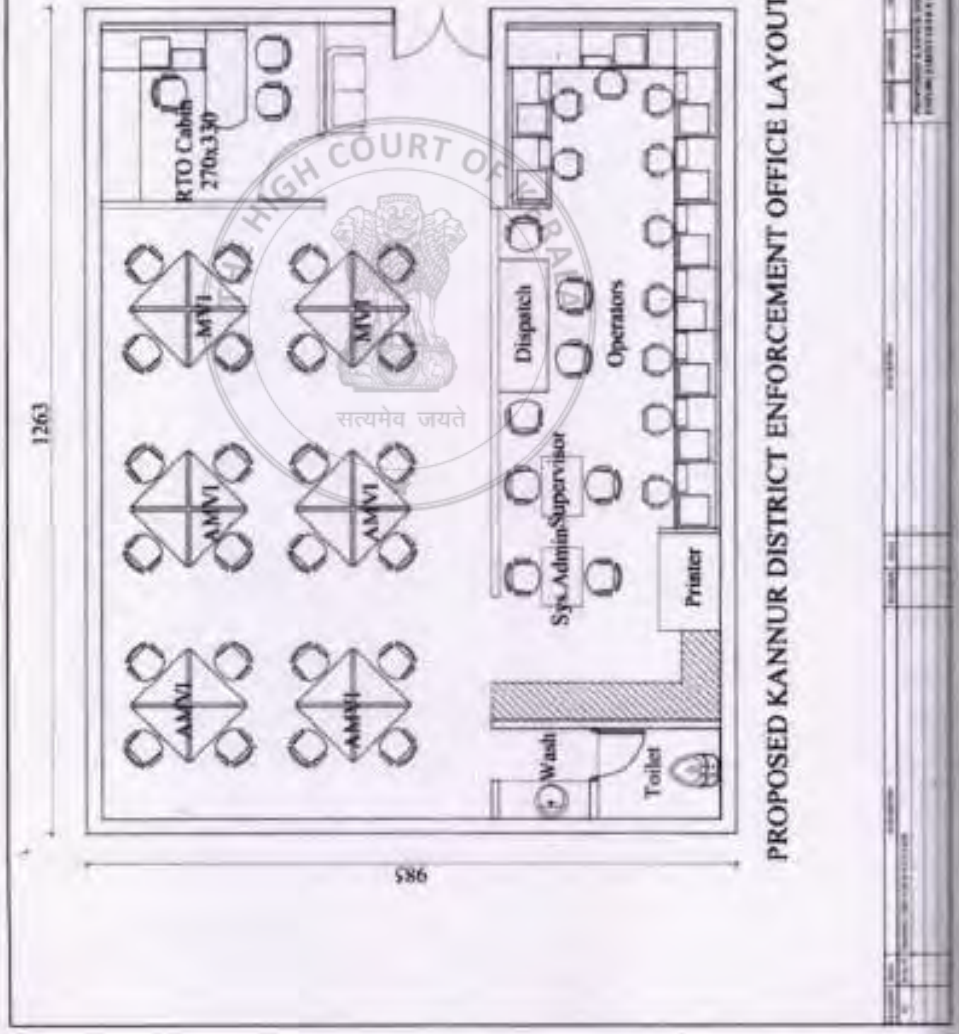
83

KELTRON

RTO Cabin -1
MVI -8
AMVI -16
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -4

SCHEDULE OF OPENINGS

FURNITURE DETAIL



PROPOSED KANNUR DISTRICT ENFORCEMENT OFFICE LAYOUT

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Mamala, Thiruvananthapuram-695 583

E1/37/2019-TC

257/2042

/2019/INWARD TC

KELTRON

RTO Cabin -1
MVI -8
AMVI -16
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -4

SCHEDULE OF OPENINGS

FURNITURE DETAIL

PROPOSED KOTTAYAM DISTRICT ENFORCEMENT OFFICE LAYOUT

RTO Cabin 270x330
MVI
AMVI
Dispatch
Operators
Sys.Admin
Supervisor
Printer
Wash
Toilet
1263
586

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Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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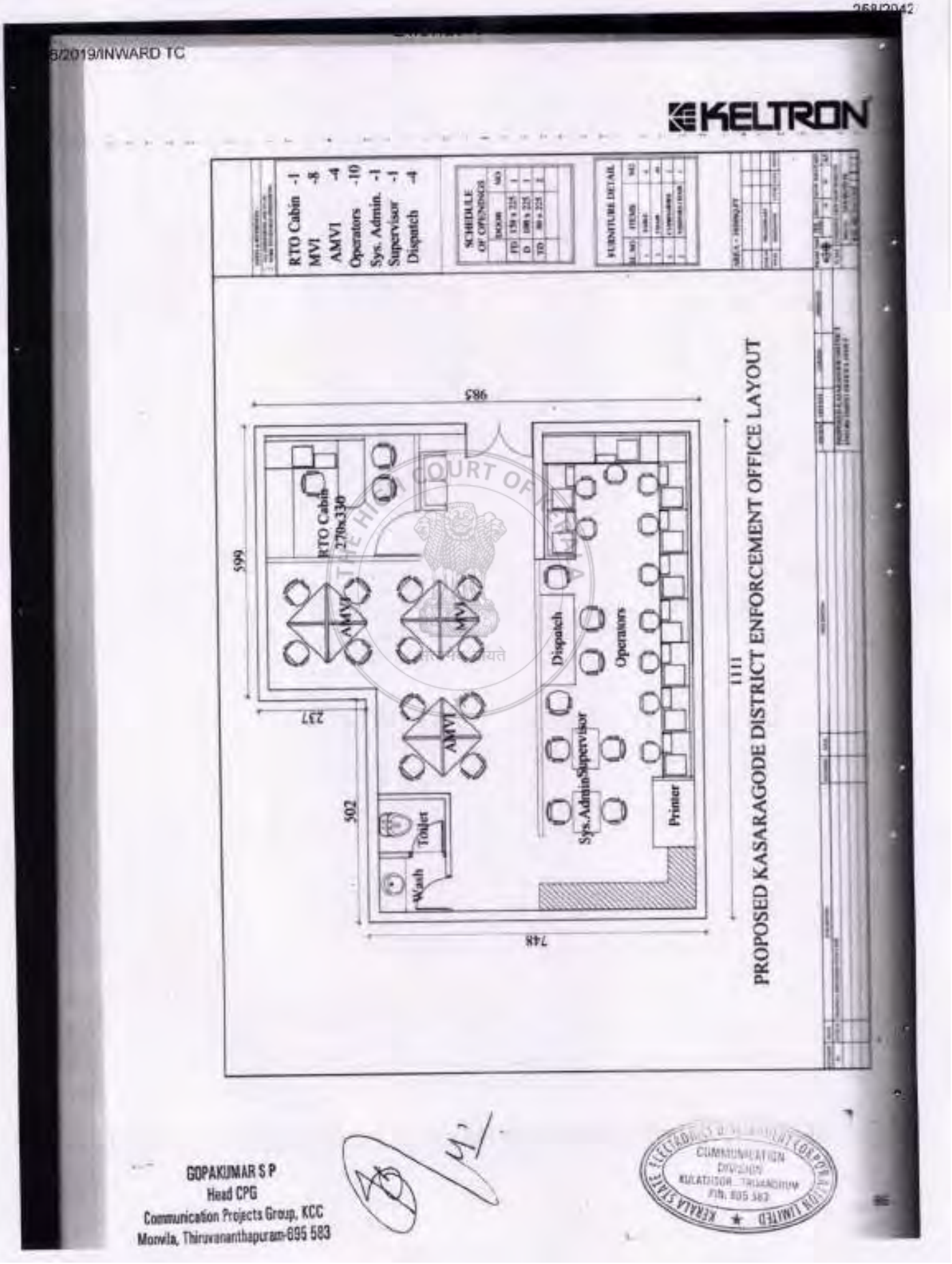
85


5/2019/INWARD TC
KELTRON
RTO Cabin -1
MVI -8
AMVI -4
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -4
SCHEDULE OF OPENINGS
FURNITURE DETAIL
RTO Cabin 270x330
AMVI
MVI
Dispatch
Operators
Sys.Admin
Supervisor
Printer
Toilet
Wash
985
599
237
502
748
1111
PROPOSED KASARAGODE DISTRICT ENFORCEMENT OFFICE LAYOUT
GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
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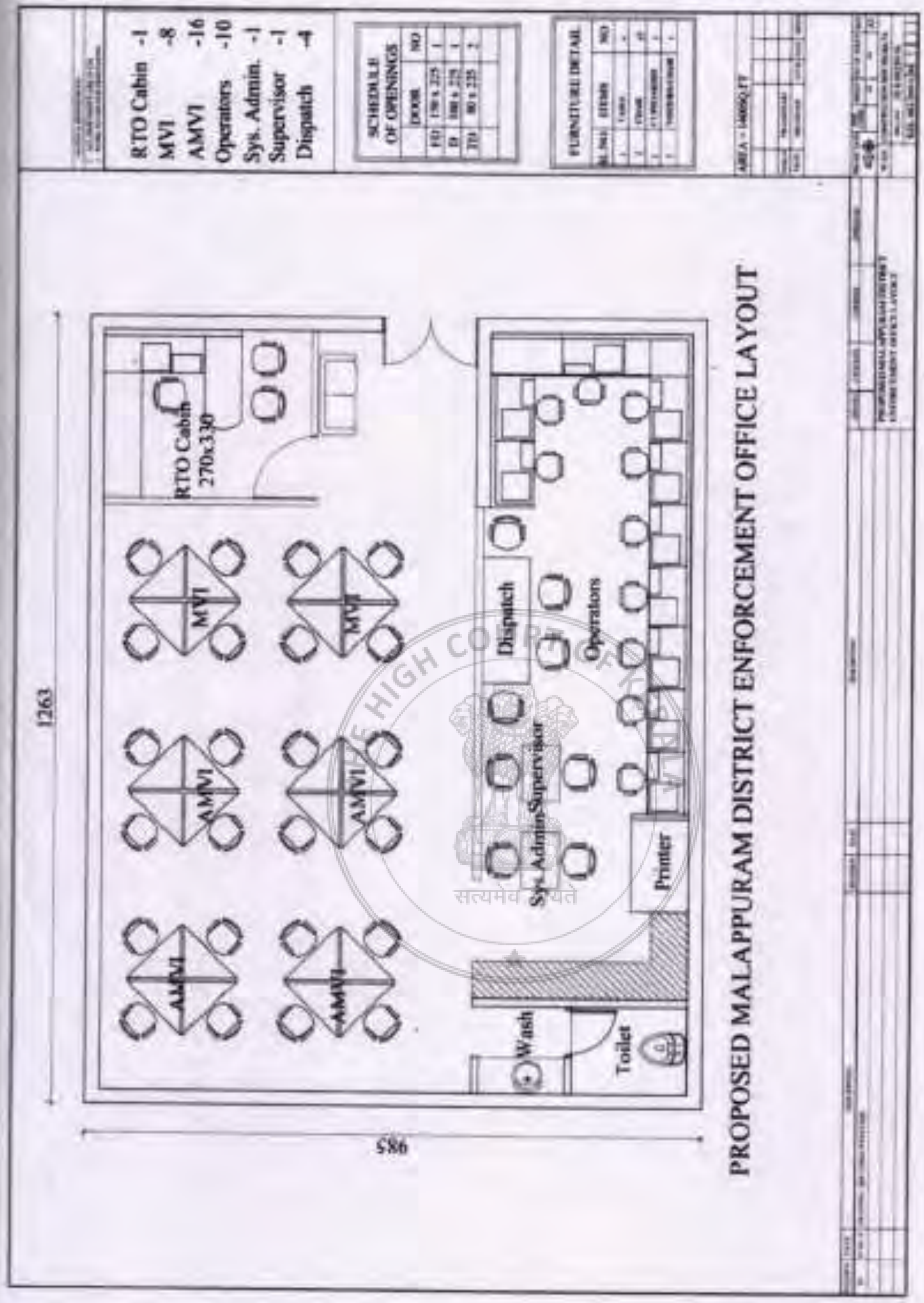
KELTRON



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Head CPG
Communication Projects Group, KCC
Menvila, Thiruvananthapuram-695 583

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COMMUNICATION DIVISION

87

E1/37/2019-TC

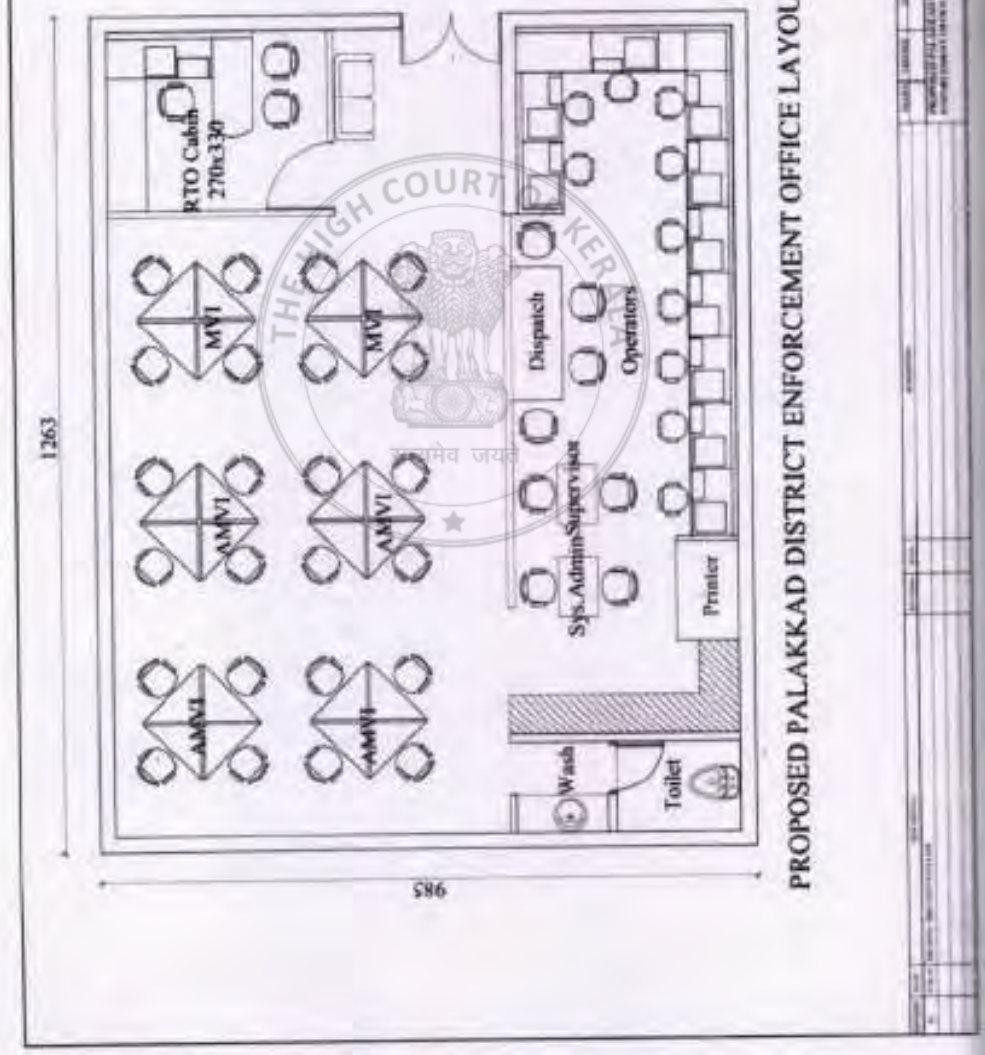
112606/2019/INWARD TC

KELTRON

RTO Cabin -1
MVI -8
AMVI -16
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -1

SCHEDULE OF OPENINGS

FURNITURE DETAIL



PROPOSED PALAKKAD DISTRICT ENFORCEMENT OFFICE LAYOUT

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Head CPG
Communication Projects Group, KCC
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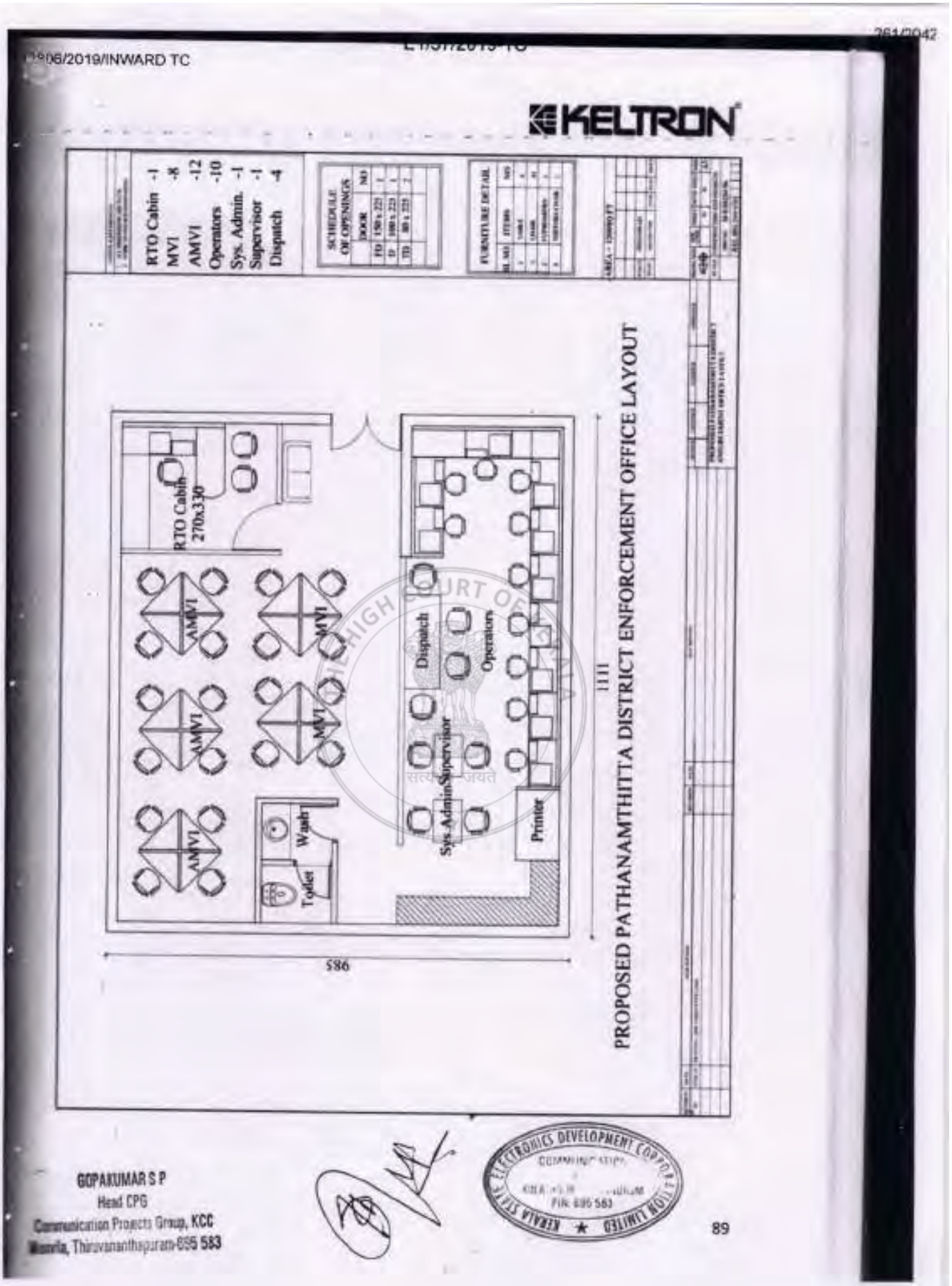
906/2019/INWARD TC
KELTRON
RTO Cabin -1
MVI -8
AMVI -12
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -4
SCHEDULE OF OPENINGS
FURNITURE DETAIL
RTO Cabin 270x330
AMVI
MVI
Dispatch
Operators
Supervisor
Sys.Admin
Printer
Wash
Toilet
586
1111
PROPOSED PATHANAMTHITTA DISTRICT ENFORCEMENT OFFICE LAYOUT
GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kazhakuttom, Thiruvananthapuram-695 583
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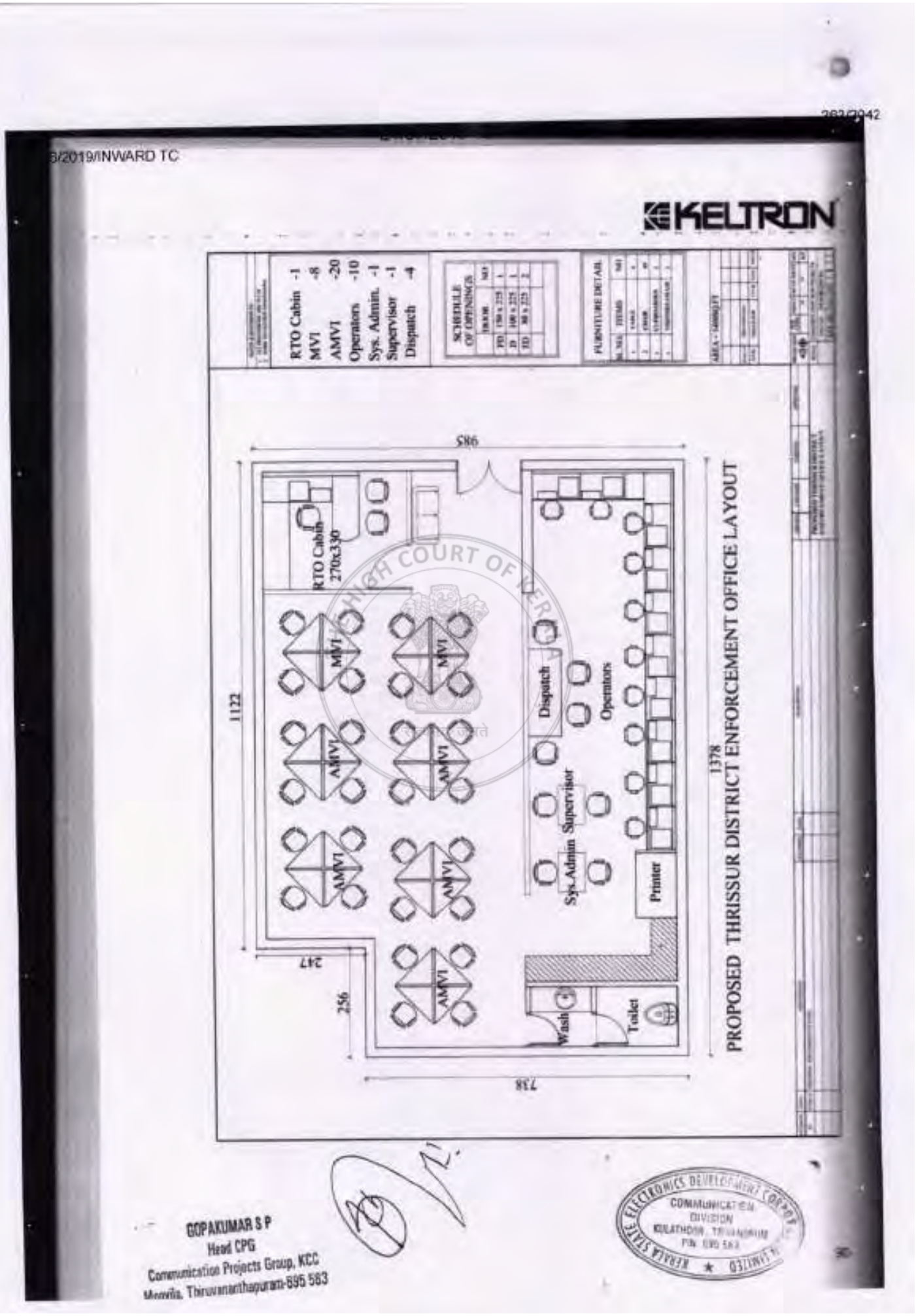
89



E1/37/2019-TC

2706/2019/INWARD TC

KELTRON

RTO Cabin -1
MVI -8
AMVI -24
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -4

SCHEDULE OF OPENINGS

FURNITURE DETAIL

586

1378

RTO Cabin 270x330

D

FD

MVI

AMVI

Dispatch

Operators

Sys.Admin

Supervisor

Printer

TD

Wash

Toilet

PROPOSED TRIVANDRUM DISTRICT ENFORCEMENT OFFICE LAYOUT

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 563

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COMMUNICATION DIVISION
KULATHOOR, TRIVANDRUM
PIN: 695 583

91

264/2042

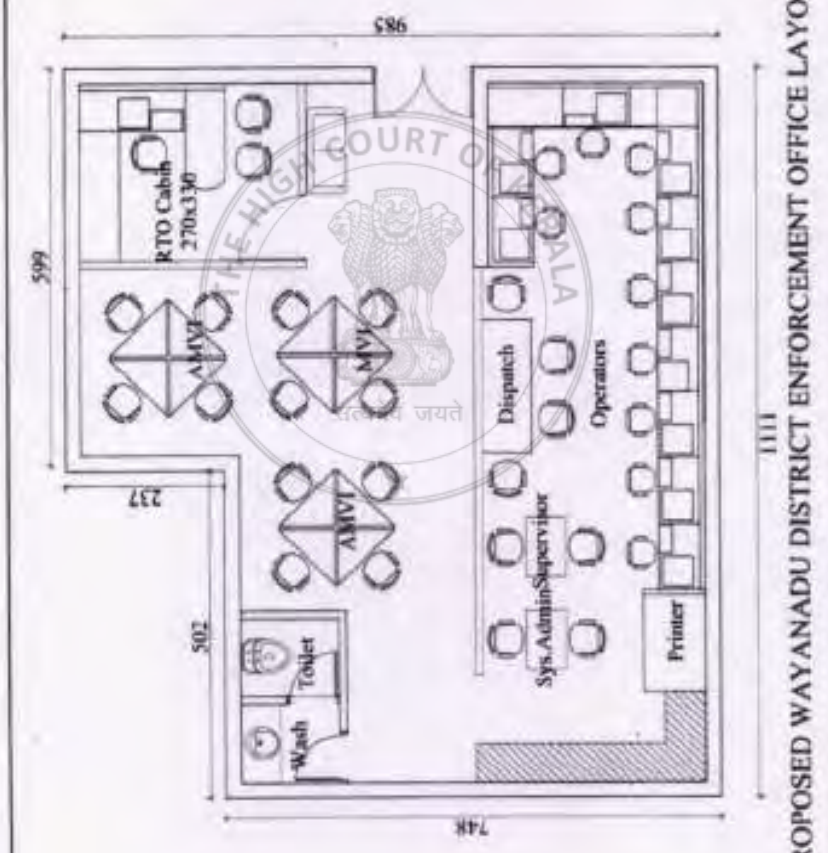
12806/2019/INWARD TC

KELTRON

RTO Cabin -1
MVI -8
AMVI -4
Operators -10
Sys. Admin. -1
Supervisor -1
Dispatch -4

SCHEDULE OF OPENINGS

FURNITURE DETAIL



PROPOSED WAYANADU DISTRICT ENFORCEMENT OFFICE LAYOUT

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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COMMUNICATION DIVISION

92

KELTRON

13. TOTAL ENGORCEMENT SYSTEM BOQ

13.1. PHASE 1

Sl. No.	Item	Qty
1	Smart AI – ANPR camera system 3M, 5M (50 x 14 districts)	675
2	Parking violation detection system	25
3	Red Light Violation Detection System	6
4	Mobile Speed Enforcement System	4
5	Fixed speed enforcement system	4
6	Control room software (central & district)	1
7	State Central Control Room HW including build up Area	1
8	District Enforcement Control Room HW & build up Area	12

13.2. PHASE 2

Sl. No.	Item	Qty
1	Smart AI – ANPR camera system 3M, 5M	700

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Thiruvananthapuram-695 583

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266/2042

E1/37/2019-TC

112

KELTRON

PART B: COMMERCIAL PROPOSAL

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Kerala Thiruvananthapuram-695 583

94

706/2019/INWARD TC E1/37/2019-TC 267/2042

KELTRON

1.CAPEX FOR 5 YEAR BOOT WITH QUATERLY ASSURED PAYMENT

Sl. No.	DESCRIPTION	Unit Price	GST @18%+ 1% CESS	Unit Price with GST & CESS	Qty.	Total with GST & CESS
1	Radar Based Speed enforcement system, 2L 1R	4,989,254	947,958	5,937,212	4	23,748,847
2	Mobile Radar based SVDS with vehicle	5,670,000	1,077,300	6,747,300	4	26,989,200
3	Red Light Violation Detection System (RLVDS) 3 ARM	7,737,345	1,470,096	9,207,441	6	55,244,643
4	3 Megapixel AI Based ANPR Camera System	916,839	174,199	1,091,038	175	190,931,722
5	5 Megapixel AI Based ANPR Camera System	945,945	179,730	1,125,675	500	562,837,275
6	PTZ- AI Based ANPR Camera System	975,051	185,260	1,160,311	25	29,007,767
7	State Central Control Room- Civil, Electrical, Furnishing, Supporting Infrastructure, IT Infrastructure supply, installation, Configuration and Commissioning & support	179,760,000	34,154,400	213,914,400	1	213,914,400
8	District Enforcement Control Room- Civil, Electrical, Furnishing, Supporting Infrastructure, IT Infrastructure supply, installation, Configuration and Commissioning & support	11,550,000	2,194,500	13,744,500	12	164,934,000
9	Laptop (i5, 1TB Hard Disk) for MVI, AMVI, RTO	157,500	29,925	187,425	354	66,348,450
10	Desktop (RTO, MVI, Supervisor, System Admin, Operators)	126,000	23,940	149,940	124	18,592,560
11	Heavy Duty Printer (Challan Printing)	630,000	119,700	749,700	14	10,495,800
12	6 KVA Online UPS with 3 Hrs. Backup	735,000	139,650	874,650	14	12,245,100

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95

KELTRON

	(District Control Room)					
13	48 Port Gigabit Switch (District Control Room)	126,000	23,940	149,940	14	2,099,160
14	Firewall (District Control Room)	420,000	79,800	499,800	14	6,997,200
15	Control Room Management Software and Integration for General Enforcement processing (Tax, Insurance, PUC etc.), SOFTWARE Violation Memo processing, ,payment management etc. as per proposal, and third party software, licenses	168,000,000	31,920,000	199,920,000	1	199,920,000
16	AMC for 4rt & 5th year (cost includes all installation, commissioning, onsite support, warranty support etc.)	44,000,000	8,360,000	52,360,000	2	104,720,000
	Total					**1,689,026,124**

TOTAL BOOT AMOUNT FOR FIVE YEAR =
Rs 1,41,93,49,648/-

GST 18% and CESS 1% =
Rs 26,96,76,440/-

TOTAL BOOT AMOUNT FOR FIVE YEAR INCLUDING GST & CESS =
Rs 1,68,90,26,124/-

GOPAKUMAR S P
Head CPG
Communication Projects Group KELTRON

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11/[illegible]/2019/INWARD TC

E1/37/2019-TC

269/2042

KELTRON

2.FACILITY MANAGEMENT SERVICES (FMS)

A. MANPOWER DEPLOYMENT						
CENTRAL CONTROL ROOM - Trivandrum						
Sl. No.	Item Description	Qty	Salary/ Month	Yearly	GST @ 18% Plus 1% Cess	Total
1	C R Manager	2	34,000	408,000	77,520	971,040
2	System Admin	2	28,370	340,440	64,684	810,247
3	Supervisor	Nil				
4	Operator	2	24,500	294,000	55,860	699,720
5	Helper	Nil				
6	Driver cum Technician	16	24,500	294,000	55,860	5,597,760
7	Diesel expenses for 4 Vehicles (Liters)	65000Ltr		4,550,000	864,500	5,414,500
8	Vehicle maintenance	4		380,000	72,200	452,200
	Total					13,945,467

DISTRICT CONTROL ROOM - Trivandrum (CAT - A)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28,370	340,440	64,684	405,124
3	Supervisor	1	26,500	318,000	60,420	378,420
4	Operator	8	24,500	294,000	55,860	2,798,880
5	Helper	1	18,500	222,000	42,180	264,180
	Total					3,846,504

DISTRICT CONTROL ROOM – Kollam (CAT - A)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	8	24500	294000	55860	2798880
5	Helper	1	18500	222000	42180	264180
	Total					3846603.6

GOPAKUMAR S R
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

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COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM

97

112806/2019/INWARD TC

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DISTRICT CONTROL ROOM – Ernakulam (CAT - A)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	8	24500	294000	55860	2798880
5	Helper	1	18500	222000	42180	264180
	Total					**3846603.6**

DISTRICT CONTROL ROOM – TRISSUR (CAT - A)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	8	24500	294000	55860	2798880
5	Helper	1	18500	222000	42180	264180
	Total					**3846603.6**

DISTRICT CONTROL ROOM – CALICUT (CAT - A)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	8	24500	294000	55860	2798880
5	Helper	1	18500	222000	42180	264180
	Total					**3846603.6**

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

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PIN: 695 583

98

271/2042

E1/37/2019-TC

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DISTRICT CONTROL ROOM – MALAPURAM (CAT - A)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	8	24500	294000	55860	2798880
5	Helper	1	18500	222000	42180	264180
	Total					**3846603.6**

DISTRICT CONTROL ROOM – KOTTAYAM (CAT - B)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	5	24500	294000	55860	1749300
5	Helper	1	18500	222000	42180	264180
	Total					**2797023.6**

DISTRICT CONTROL ROOM -PALAKKAD(CAT - B)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	5	24500	294000	55860	1749300
5	Helper	1	18500	222000	42180	264180
	Total					2797023.6

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram 695 583

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99

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DISTRICT CONTROL ROOM - KANNUR(CAT - B)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	5	24500	294000	55860	1749300
5	Helper	1	18500	222000	42180	264180
	Total					**2797023.6**

DISTRICT CONTROL ROOM – IDUKKI (CAT - C)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	4	24500	294000	55860	1399440
5	Helper	1	18500	222000	42180	264180
	Total					**2447163.6**

DISTRICT CONTROL ROOM – ALAPPUZHA (CAT - C)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	4	24500	294000	55860	1399440
5	Helper	1	18500	222000	42180	264180
	Total					**2447163.6**

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
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100

E1/37/2019-TC

06/2019/INWARD TC

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DISTRICT CONTROL ROOM –PATHANAMTHITTA (CAT - C)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	4	24500	294000	55860	1399440
5	Helper	1	18500	222000	42180	264180
	Total					2447163.6

DISTRICT CONTROL ROOM – KASARAGODE (CAT - C)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	4	24500	294000	55860	1399440
5	Helper	1	18500	222000	42180	264180
	Total					2447163.6

DISTRICT CONTROL ROOM – WAYANAD (CAT - D)						
Sl. No.	Item Description	Qty	Salary/ Month	Salary/ Year	GST @ 18% Plus 1% Cess	Total
1	C R Manager	Nil				
2	System Admin	1	28370	340440	64683.6	405123.6
3	Supervisor	1	26500	318000	60420	378420
4	Operator	3	24500	294000	55860	1049580
5	Helper	1	18500	222000	42180	264180
	Total					2097303.6

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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101

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B. RECURRING EXPENSES

Sl. No.	Item Description	Qty	Per Month	Per Year	GST @ 18% Plus 1% Cess	Total
1	Power Charge for Central Control Room	1	95000	1140000	216600	1356600
2	Power Charge for Category A Type Control Room	1	30000	360000	68400	428400
3	Power Charge for Category B Type Control Room	1	25500	306000	58140	364140
4	Power Charge for Category C Type Control Room	1	21600	259200	49248	308448
5	Power Charge for Category D Type Control Room	1	20000	240000	45600	285600
6	Main Lease line Charge at Central Control Room- 200 Mbps	1	260000	3120000	592800	3712800
7	Secondary Lease line charge - 50 Mbps	1	56000	672000	127680	799680
8	Lease line for District control room - 20 MBPS	13	29000	348000	66120	5383560
9	Diesel charges(Liter)	2000	70	140000	26600	166600
10	Power charges for RLVDS	6	2500	30000	5700	214200
11	Power charges for SVDS	4	1900	22800	4332	108528
12	Internet charges for RLVDS	6	2000	24000	4560	171360
13	Internet charges for SVDS	4	2000	24000	4560	114240
14	Internet charges for Mobil SVDS	4	2200	26400	5016	125664
15	Internet charges for AI - ANPR Cameras	700	350	4200	798	3498600
	Total					**17038420**

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC

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102

112806/2019/INWARD TC

E1/3/72019-TC

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C. CHALLAN PROCESSING & DESPATCH EXPENSES

Sl. No.	Description	Unit Price	Qty	GST @ 18% Plus 1% Cess	Total/ Year
1	Paper	20	2500000	9500000	59500000
2	Pre Printed Stationary				
3	Pre Printed Envelope				
4	Postage				
5	Toner Cost				
6	Labour				
7	Maintenance Kit for Printer				
8	Pre mailing Expenses				
	TOTAL				59500000

TOTAL FMS FOR ONE YEAR =
Rs 11,24,71,040/-

GST 18% and CESS 1% =
Rs 2,54,29,702/-

TOTAL FMS FOR ONE YEAR INCLUDING GST & CESS =
Rs 13,38,40,538

TOTAL FMS FOR FIVE YEAR =
Rs 56,23,55,200/-

GST 18% and CESS 1% =
Rs 10,68,47,488/-

TOTAL FMS FOR FIVE YEAR INCLUDING GST & CESS =
Rs 66,92,02,688/-

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Manvila, Thiruvananthapuram-695 583

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COMMUNICATION DIVISION
KULATHOOR TRIVANDRUM PIN 695 583

103

27/6/2042

KELTRON

3.PROJECTED CASHFLOW FOR THE PROJECT

REVENUE FROM DIFFERENT ENFORCEMENT SYSTEMS

Sl. No.	Enforcement System	Total No.s	Total Offence per Day	Fine Amount	Total Fine per Day	Total Fine Per Year
1	SVDS	4	80	1,000	80,000	28,000,000
2	RLVDS	6	180	1,000	180,000	63,000,000
3	Mobile SVDS	4	200	1,000	200,000	70,000,000
4	AI - ANPR Camera	700	7,000	1,000	7,000,000	2,450,000,000
	TOTAL AMMOUNT FROM FINE WITHIN ONE YEAR (INR)					2,611,000,000

REALISATION OF FINE (Assuming 60% Fine Amount Realisation)- 1st YEAR = Rs 156Cr.

REALISATION OF FINE (Assuming 30% Less Violations from Previous Year)- 2nd YEAR = Rs 109Cr.

REALISATION OF FINE (Assuming 20% Less Violations from Previous Year)- 3rd YEAR = Rs 87Cr.

REALISATION OF FINE (Assuming 20% Less Violations from Previous Year)- 4th YEAR = Rs 70Cr.

REALISATION OF FINE (Assuming 20% Less Violations from Previous Year)- 5th YEAR = Rs 56Cr.

TOTAL ESTIMATED COLLECTION WITHIN 5 YEARS = Rs 424 Cr

TOTAL AMOUNT TO BE GIVEN TO BOOT VENDOR = Rs 236Cr

BALANCE AMOUNT TO GOVERNMENT = Rs 188 Cr.

GOPAKUMAR S P
Head CPG

ELECTRONICS DEVELOPMENT CORPN. COMMUNICATION DIVISION

E1/37/2019-TC

2019/INWARD TC

277/20

KELTRON

4.COMMERCIAL PROPOSAL- ABSTRACT

TOTAL CAPEX AMOUNT FOR FIVE YEAR = Rs 1,41,93,49,648/-

TOTAL CAPEX FOR FIVE YEAR WITH GST & CESS = Rs 1,68,90,26,124/-

TOTAL FMS FOR FIVE YEAR = Rs 56,23,55,200/-

TOTAL FMS FOR FIVE YEAR WITH GST & CESS = Rs 66,92,02,688/-

QUATERLY ASSURED PAYMENT TO THE VENDOR INCLUDING CAPEX AND FMS RS= 9,90,85,242/-

QUATERLY ASSURED PAYMENT TO THE VENDOR INCLUDING CAPEX AND FMS WITH GST AND CESS RS= 11,79,11,440/-

GOPAKUMAR S P

Comm

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105

KELTRON

5.TERMS & CONDITIONS

1. Delivery and Installation: 9 months from the date of Purchase Order
2. Price: Quoted are inclusive of GST & CESS
3. Warranty is for five year comprehensive on site
4. AMC Charges for 6th and 7th year: 5% of the total quoted value per year.
5. Training: Training and documentation for operation of system will be given without any additional charge to MVD personnel as required
6. Permission for installation of, Enforcement Camera Systems at road side should be provided by Government without any additional charges
7. Permission to access vehicle owner – license database should be provided by the Department.
8. Space for building up control room should be provided by Department.
9. All recurring cost like Power charges, connectivity charges, Consumable Charges, Challan processing and dispatch are included in the FMS
10. Permission from other Department: MVD shall facilitate other department permissions if any for performing the installation work
11. Payment: 20 equal assured installments on quarterly basis within 5 years.
12. Any deviation on taxes and duties at the time of billing is applicable
13. The proposed Project is on BOOT model for 5 years.
14. The total project cost proposed is inclusive of CAPEX and OPEX
15. Validity of the proposal is 6 Months

Thanking you,

Yours faithfully,

FOR KERALA STATE ELECTRONICS

DEVELOPMENT CORPORATION LTD.

Gopakumar S P
Head – Keltron Communications Division,
Monvila, KulathurPO,Thiruvananthapuram – 695583
Phone: 04712598948 Mob. No. 09447210533
Email: spgopan@yahoo.com, e-mail: keltronseu@gmail.com

GOPAKUMAR S P
Head CPG
Communication Projects Group, KCC
Monvila, Thiruvananthapuram-695 583

KERALA STATE ELECTRONICS DEVELOPMENT CORPORATION LIMITED
COMMUNICATION DIVISION
KULATHOOR, THIRUVANANTHAPURAM
PIN: 695 583

106

Safe Kerala Project

Evaluation Report submitted by Technical Committee

Agenda : Safe Kerala Project evaluation by Technical Committee

Date : 22- October- 2019

Venue : Transport Commissionerate, Trans Tower, Vazhuthacaud, Trivandrum

Technical Committee:

1. Sri. Rajeev Puthalath - Joint Transport Commissioner & STA Secretary
2. Sri. B. Muraleekrishnan - Dy. Transport Commissioner, South Zone
3. Sri. Shibu K. Itty - Regional Transport Officer, Alappuzha
4. Sri. G. Ananthakrishnan - Regional Transport Officer(Enforcement,Eranakulam)
5. Sri. Najeeb K.M. - Motor Vehicle Inspector, DTC Eranakulam
6. Sri. Praveen Ben George - Motor Vehicle Inspector, TC's Squad

Presentation by Keltron

1. Keltron presented the Project in detail regarding the design, implementation and Facility Management Services for 5 Years on two models, 1. BOOT with quarterly annuity model and CAPEX model with 5 year FMS
2. The project include Advanced Automated Enforcement Systems, Central Control Room, District Control Rooms, Facility Management Services, Seating arrangements and laptop/Desktop for Enforcement RTOs, MVIs, AMVIs and chellan processing staffs
3. Advanced Automated Enforcement Systems:
   - **Artificial Intelligence based ANPR Camera Systems with edge processing**
     - The system will analyze the Camera outputframes and automatically detect various traffic violations & incidents like

seat belt violation, Parking Violation, helmet violation, triple riding etc.

- The identified violations will send to Central Control Room, verify the offence detection ,prepare challan against offenders and send to offenders.
- During Edge processing of the camera image frame, the system is applying trained Deep Learning, Machine Learning and Artificial Intelligence based algorithms for offence detection
- The system is capable to capture violation incidents real-time with high accuracy
- No need to fiber connectivity. The system will give results by using 4G LTE or higher data connection

- **3 D Doppler based Speed Violation Detection System**
  - Best sensor technology (German/US make Radar)
  - More than 97% accuracy (German/US make Radar)
  - Uses Average speed calculation. This will help to identify the speed violation between two SVDS system
  - Capable of tracking multiple vehicles simultaneously
  - Large vehicle classification also possible
  - We are using 4G LTE or higher data connection instead of fiber connectivity
- **3 D Doppler based Mobile Speed Violation Detection System**
  - Speed accuracy >97% using 3D Doppler radar
  - Single radar covers up to 2 lane
  - International speed calibration certification and ERTL certification.
  - 2 / 3Maga pixel high resolution ANPR camera
  - Capable to capture both retro & non-retro reflective license plates.
  - Marking on image for identification of violated vehicle
  - ON SPOT fine collection if required

- Red Light Violation Detection System
    - The system include ANPR camera capable of capturing images of vehicles including 2 wheelers, retro – non retro number plate capture at night with infrared high power flash Un-blurred high quality vehicle image and number plate image capture, greater than 1200 pixels per lane resolution, global shutter technology etc.
    - Red light jumping, stop line violation sensing for vehicles including 2 wheelers, using video analytics technology.
    - Court evidence camera with one wide angle shots showing Red traffic light and vehicle together.

4. Central Control Room
    - Fully redundant, scalable central control room for Motor Vehicle Department
    - The control Room is designed to connect any other systems other than mentioned in the project proposal
    - The central Control Room will be connected to all district Control Rooms. All the violation incidents data can be stored in the Central Control Room Server. There is no enforcement activity inside the central control Room.
5. District Control Rooms
    - There are 14 District Control Rooms(Including existing control rooms in Cochin & Calicut) in this project. All these control Rooms are connected to Central Control Room and download violation data to proceed with challan processing against violation incidents.
    - The District Control Room designed to provide Power wiring , Networking, A/c, Flooring, False Celling, seating arrangement for the MVD officials (RTO, MVIs, AMVIs, and chellan processing staff) with Laptops and connectivity
    - Challan processing and dispatch will happen from the District Control Rooms.

6. Facility Management Services (FMS)
   - The project also include Manpower for the Control Room, all requiring expenses like power charges and connectivity charges ,Challan processing charges including postage charges.
   - The FMS part covers all recurring expenses including staff salary, internet charges, printing, posting and stationary charges etc.
7. Benefit of the Project
   - Reduction of Road Accidents
   - Automated enforcement system
   - 24 hours enforcement
   - Transparency in transactions
8. Commercial Proposal
   - Keltron presented two type of commercial proposal
     - CAPEX Model
       - In the CAPEX Model Government have to invest all the amount for the Enforcement infrastructure, Control Room Infrastructures and Support for Five Years
       - Total Investment amount will be Rs: 1,399,627,541/- (Including Tax)
       - Total Facility Management Cost will be Rs: 66,92,02,688/- (Including Tax)
     - BOOT with Guaranteed Quarterly Payment
       - In the BOOT Model there is no upfront investment by Government. The System Integrator will take care of all the initial investment and run the system for a period of five years and hand over the assets to government.
       - The Government have to release quarterly guaranteed payment in each quarter after the commissioning of the project in each district.
       - Total BOOT Amount: Rs 1,68,90,26,124/- (Including Tax)

- Total Facility Management Cost will be Rs: 66,92,02,688/- (Including Tax)
- Quarterly Guaranteed Payment to the BOOT Vendor on every quarter (20 quarter)Rs11,79,11,440/- (Including Tax)
- The Quarterly Payment includes Facility Management also.
- There will be 20 Quarterly Guaranteed Payments

- Revenue Projection

Sl. No.	Enforcement System	Total No.s	Offence per Day	Fine Amt.	Fine per Day	Total Fine Per Year
1	SVDS	4	80	1,000	80,000	28,000,000
2	RLVDS	6	180	1,000	180,000	63,000,000
3	Mobile SVDS	4	200	1,000	200,000	70,000,000
4	AI - ANPR Camera	700	7,000	1,000	7,000,00 0	2,450,000,00 0
	Total for 1 year (INR)					2,611,000,00 0
	TOTAL AMMOUNT FROM FINE WITHIN ONE YEAR (INR) Rs: 261 Cr.					

Year	**Assumption**	**Expected Revenue (Rs.)**
Year-1	Assuming 60% Fine Amount Realisation	Rs 156Cr.
Year-2	Assuming 30% Less Violations from Previous Year	Rs 109Cr.
Year-3	Assuming 20% Less Violations from Previous Year	Rs 87Cr.
Year-4	Assuming 20% Less Violations from Previous Year	Rs 70Cr.
Year-5	Assuming 20% Less Violations from Previous Year	Rs 56Cr.

TOTAL ESTIMATED COLLECTION WITHIN 5 YEARS = Rs 424 Cr
TOTAL AMOUNT TO BE GIVEN TO BOOT VENDOR = Rs 236Cr
BALANCE AMOUNT TO GOVERNMENT = Rs 188 Cr.

Technical Committee Observations

- Artificial Intelligence based ANPR Camera Systems
  - The advanced technology based artificial intelligence camera output with edge processingis satisfactory. The systems are capable of detecting various violations like driving without seatbelt, riding without helmet etc. in day and night conditions
  - The system is working by using 4G LTE connection and send only violation incidents with evidence photographs. This will reduce the cost of the recurring expense and increase uptime.
  - The new technology will help to reduce internet recurring cost, storage space etc.
  - The system will help to reduce violations like no seat belt, no helmet, triple riding cases etc. 24 hour enforcement is possible.
- 3D Doppler based Speed Violation Detection System
  - The system is using latest 3 D Doppler technology. With this system we can detect spot speed and average speed with categorically. System is Capable of tracking multiple vehicles simultaneously
  - Large vehicle classification also possible, We are using 4G LTE or higher data connection instead of fiber connectivity
  - The new system will help to detect the over speeding by calculating average speed between two SVDS locations
- 3D Doppler based Mobile Speed Violation Detection System
  - Speed accuracy >97% using 3D Doppler radar, Single radar covers up to 2 lane
  - Marking on image for identification of violated vehicle

- The vehicle mount system will help to identify speed violations by moving the system from one location to another location randomly

- Red Light Violation Detection System
  - The new red light violation detection system can give more accurate violation detection with evidence data.
  - Court evidence camera with one wide angle shots showing Red traffic light and vehicle together.
- Central Control Room
  - Fully redundant and scalable Central Control Room could be the main control room not only for Safe Kerala Project, but it can meet the existing and future requirement of Motor Vehicle Department as well. Any other system outside the Safe Kerala project can also connect and integrate to the control room.
- District Control Rooms
  - 14 District Control rooms will be connected to central control room. The chellan processing and dispatch will be handled by the district control rooms. This will improve the overall efficiency of the enforcement mechanism.
  - Compared to the earlier centralized challan processing, the department can process more challan from the district control room in a distributed manner. This will improve the efficiency of enforcement and lead to significant reduction in traffic violations.
- Financial Proposal

CAPEX Model	BOOT Model
Government has to invest for the entire enforcement infrastructure and control room	No need of upfront investment. The system Integrator will take care of investment part and 5 year operations.

Payment against milestone delivery Billing	Quarterly guaranteed payment to the BOOT Vendor in 20 quarters

- The estimated total revenue from the violations during 5 year period will be around Rs: 420 Cr
- Total Estimated expense will Rs: 235 Cr
- The BOOT model implementation would be suitable model for the department. In this model there is no upfront investment. At the end of the 5th year all the enforcement equipment and office infrastructure will be the asset of the department. The project is viable in terms of revenue also.
- The project will give a new face to traffic enforcement in the state and this can be a model for the entire nation.

Technical Committee:

1. Sri. Rajeev Puthalath -
2. Sri. B. Muraleckrishnan -
3. Sri. Shibu K. Itty -
4. Sri. G. Ananthakrishnan -
5. Sri. Najeeb K.M. -
6. Sri. Praveen Ben George -

E1/37/2019-TC
File No.TRANS-A2/258/2019-TRANS

12 MIT TC

(10) Annexure X (15)

GOVERNMENT OF KERALA

Abstract

Transport Department – IT based projects - Evaluation and vetting of proposals - Technical Committee constituted – Orders issued.

TRANSPORT (A) DEPARTMENT

G.O.(Rt)No.559/2019/TRANS Dated,Thiruvananthapuram, 17/12/2019

Read: G.O(Ms) No. 18/2017/ITD dated 23.07.2017.

ORDER

Government are pleased to constitute a Technical Committee with the following composition for evaluation and vetting of proposals of IT based projects under Transport Department in Government

1. Principal Secretary, Transport Department
2. Transport Commissioner
3. Director, KSITM (Kerala State IT Mission) / Representative of the Director
4. Representative from State e-Governance Mission Team
5. Nodal Officer, 'Safe Kerala' project.

(By order of the Governor)
K R JYOTHILAL
PRINCIPAL SECRETARY

Transport Commissioner, Thiruvananthapuram.

Road Safety Commissioner, Kerala Road Safety Authority, Thiruvananthapuram.

Chairman & Managing Dicrector, Kerala State Road Transport Corporation, Thiruvananthapuram.

E1/37/2019-TC
File No.TRANS-A2/258/2019-TRANS

123378/2020/MIT TC

Director, State Water Transport Department, Near KSRTC Bus Station, Alappuzha.

Director, Kerala State IT Mission (KSITM), Vellayambalam, Thiruvananthapuram.

Head, State e-Governance Mission Team, Uppalam Road, Statue, Thiruvananthapuram.

Nodal Officer, 'Safe Kerala' project (Through Transport Commissioner)

Principal Accountant General (Audit / A&E), Kerala, Thiruvananthapuram.

Electronics & Information Technology (IT Cell) Department

Information & Public Relations (Web & New Media) Department

(For publishing in the official website).

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PA to Principal Secretary (Transport)

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Section Officer

32/2042

File No. TRANS-A2-258/2019-TRANS

INWARD TC

Annex X1

Minutes of the meeting of the Technical Committee held on 28.12.2019 in the chamber of the Principal Secretary (Transport) for evaluation and vetting of the project proposal for 'Fully automated traffic enforcement system' for 'Safe Kerala' project

The meeting commenced at 11.40 am under the Chairmanship of Principal Secretary (Transport). The following officials attended the meeting

1. Smt. R. Sreelekha IPS, Transport Commissioner
2. Shri. Rajeev Puthalath, Joint Transport Commissioner
3. Shri. Santhosh Kumar, Senior Consultant, Kerala State IT Mission
4. Shri. Gopakumar.I.P, Head (Commercial Division), Keltron
5. Shri. Shibu.K.Itty, Nodal Officer, 'Safe Kerala' project

The Senior Consultant, KSITM pointed out that Keltron has prepared and forwarded project proposals for automated traffic enforcement system to both Police Department and the Motor Vehicle Department. Hence it should be ensured that the infrastructure to be developed under the project should not get duplicated by both the Departments to avoid wastage of infrastructure.

The Transport Commissioner clarified that traffic management is the duty of Police Department whereas traffic enforcement is solely being maintained by Motor Vehicle Department. Hence the purpose of automated systems implemented by these departments are different. Motor Vehicle Department is entitled to impose penalty for traffic violations including licence suspension, cancellation of licence etc. Since 'Safe Kerala' is the traffic enforcement programme exclusively being implemented by Motor Vehicle Department, the fully automated enforcement system proposed is highly essential for the effective implementation of the project. It is also pointed out that in other states, traffic management and traffic enforcement are being done by Police and the Motor Vehicle Departments separately.

The representative of Keltron has also pointed out that there is no duplication of infrastructure developed for Police Department and the Motor Vehicle Department

till now.

Principal Secretary (Transport) directed to ensure that cameras under the project are not installed in the same location by different agencies. For this, data sharing between Police Department and the Motor Vehicle Department is necessary. Motor Vehicle Department should identify the locations in which cameras are to be installed and share this data with Police Department so as to avoid wastage / overlapping of infrastructure. Principal Secretary also pointed out that a good number of cameras installed by different agencies as part of traffic management / enforcement are not working as observed in the review meeting held by the Hon'ble Chief Minister. Hence it should be monitored whether the cameras installed under this project are working. He also directed that the AMC for maintaining the cameras should be given for a period of 10 years.

The Principal Secretary asked whether the facilities of State Data Centre under Kerala State IT Mission can be made available to Motor Vehicle Department for collection of data from the new cameras. Representative of KSITM informed that there are practical difficulties in accommodating data afresh under SDC. The Joint Transport Commissioner informed that the data centre under Vahan Sarathy can be used free of cost when linked to Vahan Sarathy.

After detailed discussions, the Technical Committee approved the boot model of the proposal submitted by Motor Vehicle Department for implementing fully automated traffic enforcement system for 'Safe Kerala' project subject to certain conditions as mentioned below.

The meeting ended at 12.25 pm.

Decision of the Technical Committee

Approved the proposal submitted by Motor Vehicle Department for implementing 'Advanced automated traffic enforcement system on boot model for 5 years and Facility Management Services for 5 years' under 'Safe Kerala' Project, subject to the following Conditions

i. The Motor Vehicle Department should identify the exact location in which cameras are to be installed and share this data with Police Department to avoid duplication / wastage of infrastructure. It

should be ensured that cameras are not installed in the same location by different agencies.

ii. The data collected through the cameras may be shared with Police Department on a need based strategy.

iii. It should be frequently monitored to ensure whether the cameras installed under the project are working. AMC for maintaining the cameras should be given for an extended period of 10 years.

Shri. K.R. Jyothilal
Principal Secretary (Transport)

Smt. R.Sreelekha
Transport Commissioner

Shri. Santhosh Kumar
Sr. Consultant, KSITM

Shri. Shibu.K.Itty
Nodal Officer (Safe Kerala)