

# *AutoEmission Eye*

**IOT based automated quality analysis  
system for monitoring flue gases- of  
individual vehicle engine!**

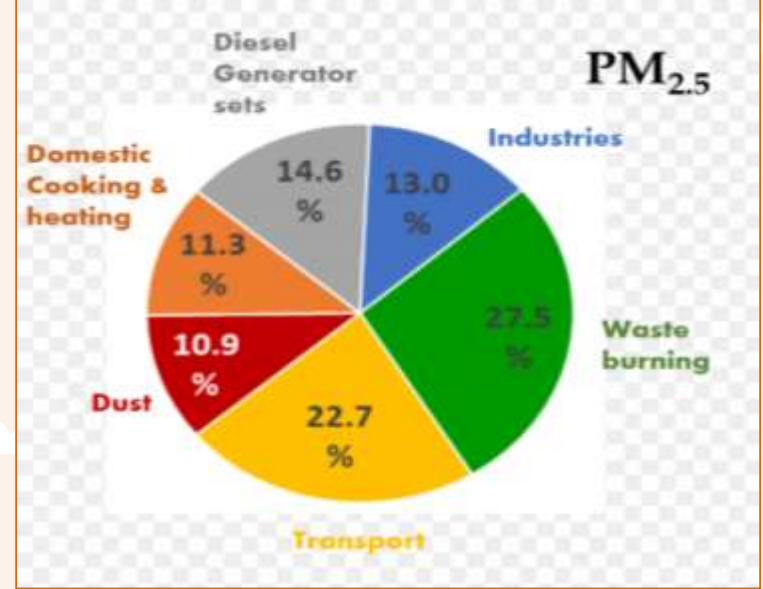




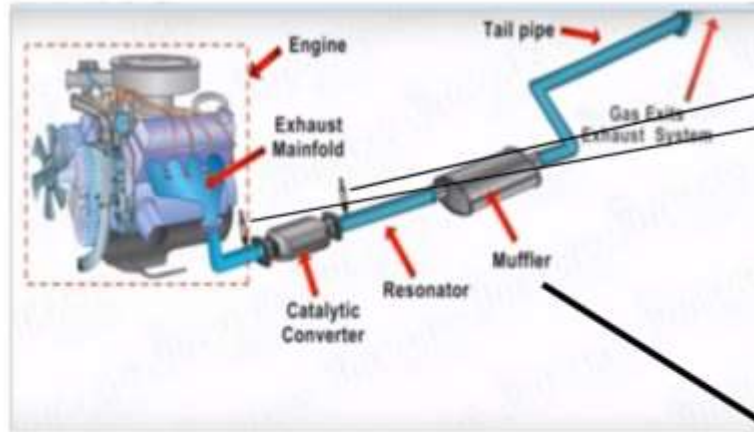
**VEHICLES; THE BIGGEST POLLUTERS**

- Pune is among 16 cities from central and western India that have shown a stable trend in air pollution this winter, as compared to previous years, according to analysis of real-time data carried out by the Centre for Science and Environment (CSE).

- **At the national level, Pune was ranked 79th in air pollution in 2020-21.**



- India and China constitute a **“High Risk”** zone of PM<sub>2.5</sub>. Basically vehicular emission contributes 20%-30% of Particulate Matter at the breathing level of air quality. India stands 8th in having hazardous air quality among global countries.  
**“Air pollution contributes to the premature deaths of 2M Indians every year”**



At This Catalytic Converter The Sensors Named ECU(Electronic Control Unit) Are Present.

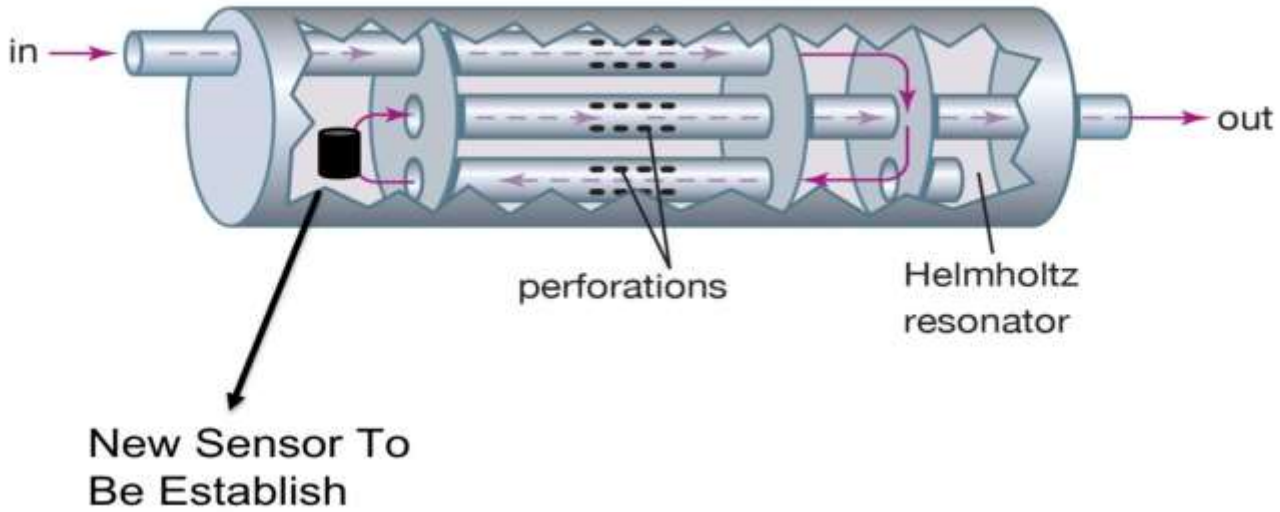
"Let Us Consider Mahindra Bolero Pickup.  
A Pick Up Truck Silencer"



Near This Part  
The Sensors For  
Data Collection  
Must Be Applied.



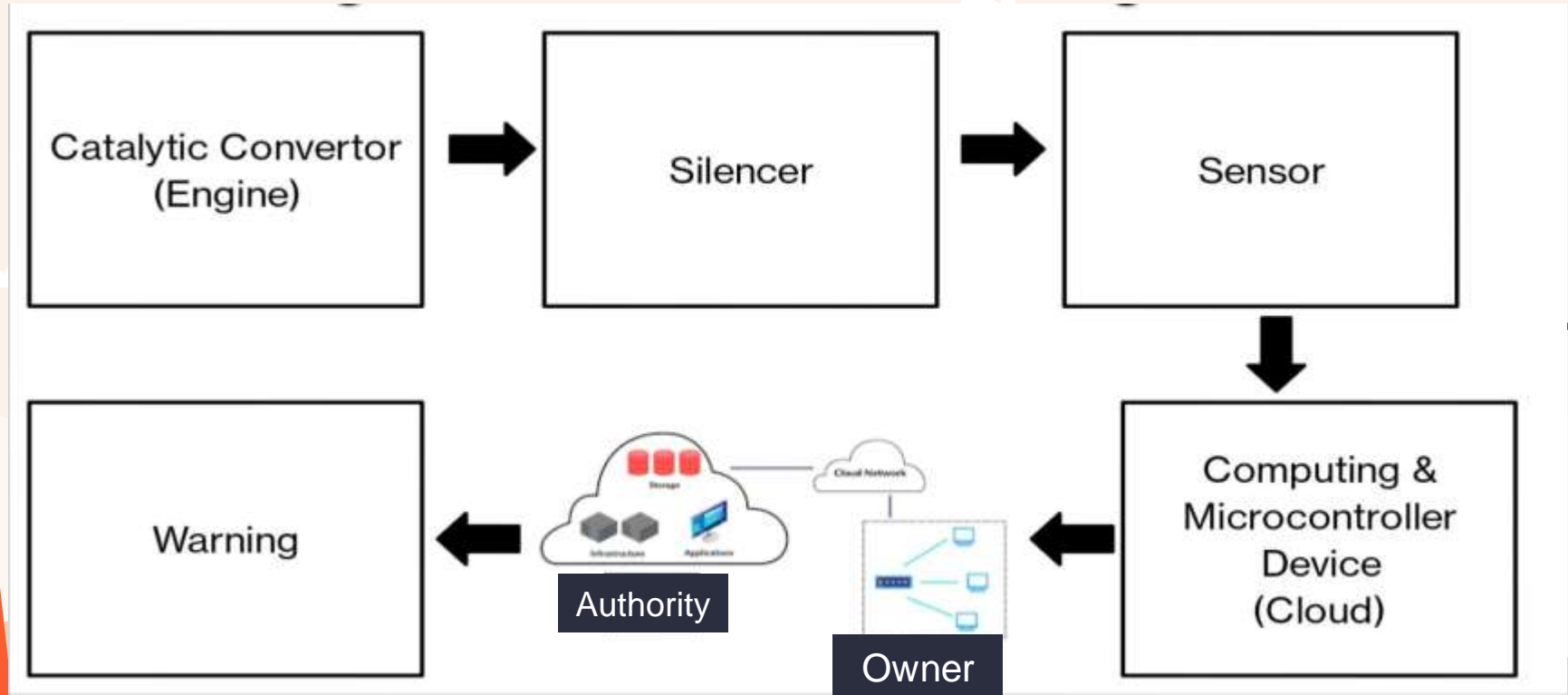
# DIAGRAM OF SILENCER (MUFFLER)



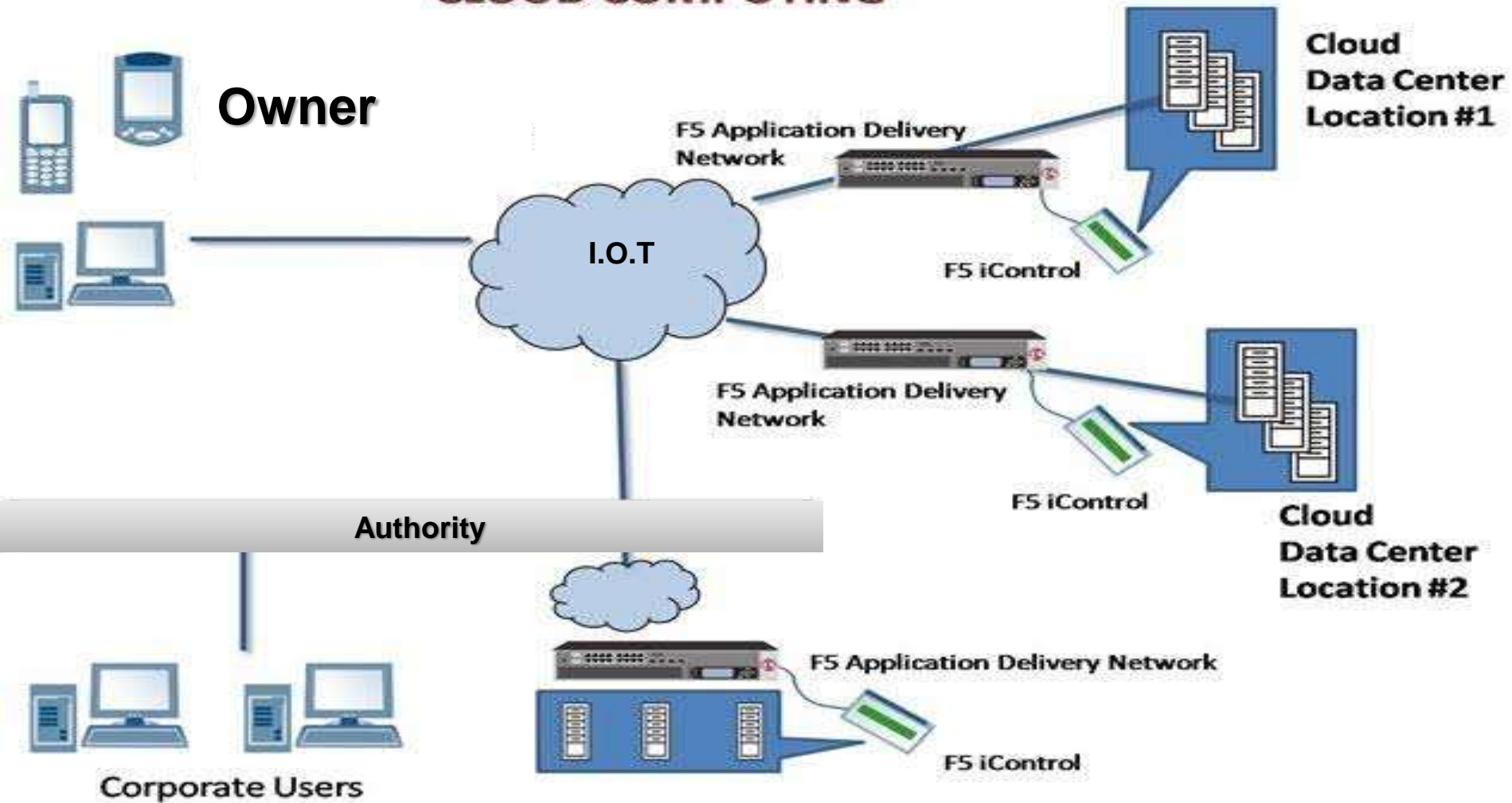


Name of the sensor	detection	Dimension (approx.)	Price	Conc range detection in ppm
MQ-135	ammonia, Sulphur, benzene and CO <sub>2</sub>	35mm x 22mm x 23mm	INR 100-150	10-1000ppm
MQ-7	Carbon monoxide (CO)	35mm x 20mm x 11mm	INR 88-120	20 PPM to 2000 PPM
MQ-4	Natural gas and methane	31mm x 19mm x 21mm	INR 90-130	200 to 10000ppm
PM 2.5	Inhalable flue gases having diameter less than 2.5 micrometer	110mm x 84mm x 44mm	INR 6000	0 to 1 ppm
MQ-136	Sulphoxides H <sub>2</sub> S	32mm X22mm X27mm	INR 1600	200 ppm

# BLOCK DIAGRAM OF THE DEVICE



# CLOUD COMPUTING





# Working

- Smoke Which Contains Flue Gases Enters The Silencer Through The Engine And Catalytic Convertor After Every Modification With The Help Of The ECU Is Completed.
- In Silencer The Smoke Is Further Passed To The Sensors Which Are Attached At The Last Perforation Of The Silencer.
- Sensor Contains Sensing Element And Tin-Dioxide( $\text{SnO}_2$ ) As A Semiconductor. When The Heat Is Generated In the Silencer, Sensor Warms up & Gases Present In The Smoke Interact With The Heated Sensing Element ,That Causes Change In The Electrical Resistance.
- The Sensing Element Which Measures The Change In The Resistance Now Converts them into Electrical Signals That Is Processed By Microcontroller.
- Microcontroller Which Will Have Some Threshold Values Now Compare The Provided And Detected Data/values & Stores The Data On The Cloud.
- Further If The Detected Data Exceeds The limits Then It Shares The Information To The Authority And Throws The Warning To The Owner. The Warning Is Given Twice & If The Servicing Is Not Done, The User Is Penalized By The Authority.

# ALL ABOUT PUC

**POLLUTION UNDER CONTROL CERTIFICATE**  
 Authorised By: RTA, FARIDABAD  
 Transport Department, Haryana

**TEST RESULT : PASS**  
**VALID TILL: 11/Nov/2021**

Certificate St. No.: HR03800220007751  
 Registration No.: [REDACTED]  
 Chassis No.: [REDACTED]  
 Engine No.: [REDACTED]  
 Class of Vehicle: Motor Car  
 Make: MARUTI SUZUKI INDIA LTD  
 Model: AAFN0047F041002  
 Vehicle Category: LIGHT MOTOR VEHICLE  
 Date of Registration: 13/Nov/2017  
 Emission Norms: BHARAT STAGE IV  
 Fuel: PETROL/CNG  
 Date of Testing: 12/Nov/2020

**PETROL/CNG/LPG DRIVEN VEHICLES**  
 Certified that the vehicle conforms to the standards prescribed under rule 115(2) of CMV Rules 1989  
 CO Level at Idling (% Volume) (PPM)  
 HC Level at idling (RPM)

FUEL	Prescribed Standard CO	Measured Value	Prescribed Standard HC	Measured Value
PETROL	0.3	0.2	200.0	170.0

Auto Emission Testing Centre Code: HR0380022  
 Testing Centre Name: D.K.POLLUTION CHECKING CENTRE  
 Centre Address: SHAHEED RAJIVR AUTO CENTRE, SEC-17 FBD INDIAN OIL PUMP, 121002.  
 Test Conducted By: [REDACTED]

In case of any complain Please write to Transport Commissioner Haryana

**POLLUTION UNDER CONTROL CERTIFICATE**  
 Authorised By: Transport Department Uttar Pradesh

**TEST RESULT : PASS**  
**VALID TILL: 28/Nov/2020**

Certificate St. No.: UP0000010004701  
 Registration No.: [REDACTED]  
 Chassis No.: [REDACTED]  
 Engine No.: [REDACTED]  
 Class of Vehicle: M-Cycle (Scooter)  
 Make: HINDI MOTORCYCLES LTD  
 Model: BLANQUET FI  
 Vehicle Category: TWO WHEELER(MT)  
 Engine (Cyls/Cl): 4 Stroke  
 Date of Registration: 28/Nov/2018  
 Emission Norms: EURO 2  
 Fuel: PETROL  
 Date of Testing: 28/Nov/2020  
 PUC Equipment Manufacturer Name: [REDACTED]  
 PUC Equipment Manufacturer Model: DV000444  
 Name: [REDACTED]  
 PUC Equipment Serial No.: [REDACTED]

**PETROL/CNG/LPG DRIVEN VEHICLES**  
 Certified that the vehicle conforms to the standards prescribed under rule 115(2) of CMV Rules 1989  
 CO Level at Idling (% Volume) (PPM)  
 HC Level at idling (RPM)

FUEL	Prescribed Standard CO	Measured Value	Prescribed Standard HC	Measured Value
PETROL	3.5	3.2	4500.0	275.0

Auto Emission Testing Centre Code: UP0000001  
 Testing Centre Name: SUNDAR DEVI BHADRAWAN  
 Centre Address: HARBANSIPUR, RO-SADAR, DIST: AZAMGARH, JHARKHAND  
 DIST: AZAMGARH, JHARKHAND  
 Test Conducted By: NAM SETHI YADAV

**TEST RESULT FOR PETROL/CNG/LPG VEHICLE**

CO	MEASURED VALUE	UNIT
CO-CORRECTED	3.2	%
HC	275.0	PPM
CO2	135.0	%
CO	3.5	%
HC	0.0	PPM
OIL TEMP	0.0	DEGREE CENTIGRADE

In Case Of Any Complaint Please Contact U.P. Transport Department Helpline: 1000100101  
 This is a computer generated certificate and does not require signature

Standard Acceptable Values:-  
 For Petrol;  
 CO:-3.5,HC:-4500

For Diesel;  
 Co:-0.3,HC:-200

# Conclusion:-

**Realizing The Need Of The Hour,  
We As A Team Propose An Idea Of A System That Continuously  
Monitors The Emission Level Of Vehicles By An IoT Based Kit  
Using Various Gas Sensors, Micro-controller & A W-Fi Module.  
Any Defect in The Vehicular Emission Generates A Notification  
To Alert the Authority As Well As The Owner For Further  
Necessary Actions Towards Reducing Pollution. Through This,  
We Aspire To Deliver A Massive Social Impact on Our Society.**



*Thank You !!*

Sanika Mali  
Nilaya Desai  
Ketan Agrawal  
Bhairavnath Borate