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Pune Case Study

Innovation and the Automotive Component Manufacturing in India

2nd International Conference on the Process of Innovation & Learning in Dynamic City Regions

September 2005

Bangalore

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2nd International Conference on the Process of Innovation and Learning in Dynamic City-Regions in Bangalore, India July 2005

Innovation and the Automotive Component Manufacturing in India (Pune Case Study)

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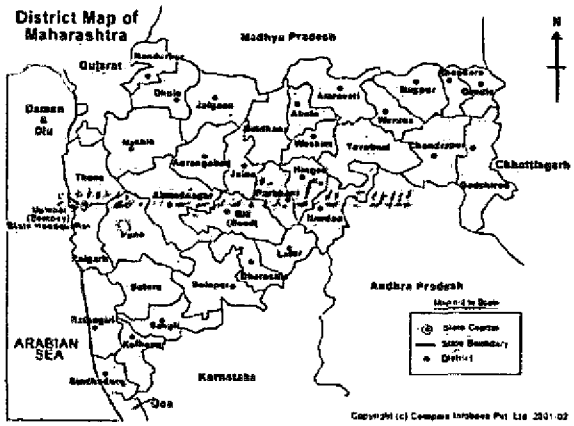

INVESTIGATIONS INTO THE PROCESS OF INNOVATION IN THE INDIAN AUTOMOTIVE COMPONENT MANUFACTURERS WITH REFERENCE TO PUNE AS A DYNAMIC CITY-REGION

Acknowledgement:
The study on the Innovation and the Automotive Component Manufacturing in India, Case Study of Pune, was prepared in connection with the 2nd International Conference on the Process of Innovation and Learning in Dynamic City-Regions, conducted in Bangalore, India, during the period 13-15 July 2005.

The National Expert Dr. Sumit Roy, Co-Founder and counsellor of the company "Partners in Charge", prepared this case study.

Ms. Shadia Yousif Bakhait, Industrial Development Offices (IDO) within the Strategic Research and Economics Brach of UNIDO provided inputs and guidance for the case study. Ms. Loreto Reyes, UNIDO Intern, provided secretarial support and editing. Mr. V. Suresh, Advisor and Director General, Good Governance India Foundation provided support and leads for the case study.

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Introduction

Pune is situated on the banks of the confluence of the Mula and Mutha rivers which are tributaries of the river Bhima which flows east rising from the Western Ghats of Maharashtra. The city is located at an altitude of over 1,800ft above the sea level, with an average rainfall of 170cm per annum. It has the bracing climate of a hill station. On the western side of Pune is the Pashan lake that is used to supply water to the city.

Map I: Position of the State of Maharashtra

Pune district has several hill forts along with many ancient temples. Pune gets good quantity of drinking water. Industry also gets ample water supply, as it is supplied by the Maharashtra Industrial Development Corporation (MIDC), which is quite efficient.

Marathi is the language of the majority of the people residing here. Residents of Pune city call themselves 'Punekar'. 'kar' is a marathi language suffix used to denote a person belonging to the preceding village or city name. This being a metropolitan city with many English literate people, 'Puneites' is also a term commonly used to describe the people of this city, particularly in English dailies.

According to the official statistics based on the year 2001 census provisional results, Pune city had a population of 3.755 million in 2001. This figure includes the people residing in the city of Pimpri-Chinchwad which has historically been considered as a twin of Pune. The real population of the combined metropolitan area could be estimated between 4.5 to 5 million in 2004.

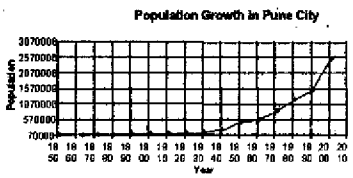

Chart I: Population Growth in Pune

Chart I and Chart II present the population charts of Pune based on information collected from Industrial & Commercial Directory of Pune, Mahratta Chamber of Commerce & Industries, Pune, 1972, 1978, 1985, 1990, 1995, 2002.

These adjacent trend charts present the population growth of Pune city and that of the Pimpri-Chinchwad area. Both the places have registered high increase in population almost exponential. Pune's growth could be seen from 1950s while that of Pimpri-Chinchwad could be seen from 1970 almost coinciding with the development of the auto giants TELCO and BAJAJ.

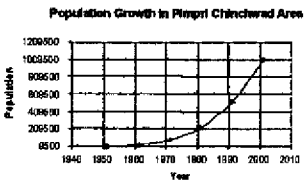

Chart II: Population Growth in Pimpri-Chinchwad Area

Brief History of Pune city and its related region

Pune, formerly called Poona, is the second largest city (after Mumbai) in the state of Maharashtra, India. This is historically an important city. The Maratha was headquartered here in Pune. History proves that the city was developed much earlier. The archaeological relics point

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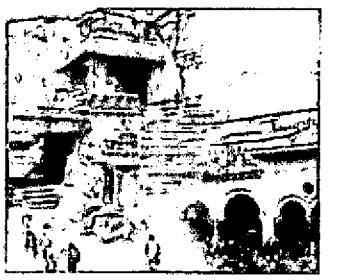
out that Pune was established as a township in the 8th century. Prior to the Marathas, evidence of inhabitance comes from relics like the Kasba Ganapati, Taambdee Jogeshwaaree, Pataleshwar cave. It is also called the Panchaleshvara Caves, which was situated outside the old town. Now the Panchaleshvara Caves are situated squarely in the middle of the city on what is today Jungli Maharaj Road.


The Panchaleshvara caves in Pune

A copper plate inscription of 973 A.D. reveals that the name of the town was 'Punya –Vishaya' or 'Poonak-Vishaya', during the regime of Rashtrakoots of the Deccan plateau. The Yadavas of Davagiri overthrew them in 1294 A.D. Later on, the Bahamani kingdom had control for a very short period. Delhi Sultans, successors of Khilji and Ghulam dynasties took interest in Pune and administered Pune in the 15th century. Later, Maloji Bhosale of Verool offered military aid to Nizamshahi and Mughals and got the Jahagir of Pune and Supe region in 1595. In 1674, Shivaji became the king in a traditional Hindu coronation ceremony, and took on the title of Chhatrapati, or Holder of the Umbrella, representing the protection he bestowed on his people. Shivaji is remembered as a just and wise king. He established an effective civil and military administration and adopted a policy of religious tolerance to accommodate all religions and sects. From 1700s to 1818, Pune was the de facto capital of India. The British power could rule the whole of India only after the tragic fall of Pune. Entire India then become a colony of the British empire and remained so for a little over 125 years. Pune was the cradle and the citadel of the Indian independence movement. Pune district has several hill forts along with many ancient temples. The city is close to many strong forts like Sinhagad, Rajgad,Toma, Purandar, Shivneri, Pratapgad,etc. Pune naturally attracted the empire builders who desired to gain control of coastal parts, westernghats and eastern plains of the present territory of western Maharashtra. No wonder that power after power employed its military strategies for capturing Pune and keeping it under its firm control. It grew in importance under the British when it housed a major cantonment town. Pune is the Headquarters of the Southern Command of the Indian Army. The Cantonment area is still a major fixture and adds to Pune's cosmopolitan flavour.

The following table chronologically captures the development of Pune city from the year 1637.

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Year	Landmark developments in Pune city
1637	Town came under ' SHAHAJI' rule and Shaniwar, Somwar, Raviwar Peths founded.
1656	Town came in possession of Shivaji
1721	Bajirao Peshwal 1 reconstruction of Pune.
1761	Lakdi (Sambhaji) Bridge constructed.
1818	British rule commenced Pune and Khadi Cantonments established.
1856	Pune-Mumbay Railway introduced
1857	Pune city Municipality established
1880	Khadakwasla Dam constructed
1885	Mundhwa Paper Mill started
1916	First town planning scheme was undertaken by municipality.
1919	Underground drainage scheme introducer.
1920	Electricity introduced in the city
1934	Mahratta Chamber of Commerce & Industries established.
1941	Silver Jubilee Motor Transport City Bus Service started.
1950	Pune Municipal Corporation established and Municipal Bus Service, National Chemical Laboratory started functioning.
1952	First Master Plan of Greater Pune was prepared University of Poona and National Defense Academy established.
1953	A.I.R. Pune Station started
1956	Hindustan Antibiotics Ltd.- first public sector undertakings at Pimpri,and Hadapsar Industrial Estate established
1961	Development of Bhosari Industrial Estate bu the MIDC started
1970	Plan of the Pune Metropolitan Region released
1971	Vikram Satellite Earth Station at Arvi near Pune commissioned
1972	Establishment of Pimpri Chinchwad New Township Development Authority
1973	Installation of T.V Relay Tower at Sinhagad and introduction of Televition in Pune.
1977	New Civil Airport at Pune opened.
1983	MITCON starts functioning with Pune as the headquarters
1986	National Information Centre at Pune started functioning
1987	Center for Development of Advanced Computing (C-DAC) started at Pune.
1989	Center for Development of material for electronic technology (C-MET) was set up at Pune.
1993	"Sports City" – a sports stadium of international standard started at Balewadi

Table I: The Landmarks Developments in Pune
Source: Industrial & Commercial Directory of Pune, Mahratta Chamber of Commerce & Industries, Pune 1995

Facts and Findings of the region

Pune Division[1] is one of the six divisions of Maharashtra. Pune Division is bound by Konkan Division to the west, Nashik Division to the north, Marathawada Aurangabad Division to the east, and the state of Karnataka to the south.

The followings are facts for Pune Division:

Area:	57,268 km²
Population (2001 census):	99,973,761
Districts:	Kolhapur, Pune, Sangli, Satara, Solapur
Literacy:	76.95%
Area under irrigation:	8,896 km²
Main crops:	Jowar, wheat, bajra, sugarcane, rice, soybean, onion, groundnut, vegetables, turmeric, grape, pomegranate

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[1] Source: www.history.com

The Pune region consists of five districts: Pune, Satara, Sangli, Kolhapur and Solapur. Pimpri-Chinchwad, Talwade where a software park is established, Jejuri, Kurkumbh, Pandare, Bhigwan are the major areas within the Pune district and the growth centres are Baramati and Shirur (Ranjangaon). Other major areas in above districts are Satara, Wai, Sangli, Miraj, Islampur, Kolhapur, Gokul-Shirgaon, Halkarni, Solapur and Chincholi. Growth centres are Karad, Kagal, Gadhinglaj, Hatkanangoe, Tembhurni and Mangalwedha. The District industries centres, which have been functioning since 1979, are the focal point for development of small scale industries. There are about 38,000 permanently registered and 27,000 provisionally registered small-scale units in the Pune region.

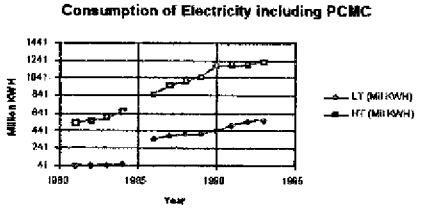

Chart III: Consumption of Electricity including PCMP

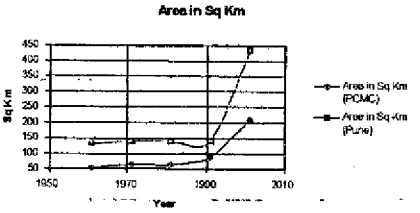

Chart IV: Area of Pune in SQ Km

According to the Industrial & Commercial Directory of Pune, Mahratta Chamber of Commerce & Industries of Pune for the years 1972, 1978, 1985, 1990, 1995, 2002, the area in square kilometres have also been increasing. Since 1990 more villages are added to Pune city area and also to the Pune Chinchwad Municipal Corporation (PCMC) area as shown on Chart IV. The cost of living has also been increasing almost exponentially since around the year 1980, as shown on Chart V. Apart from other factors, the economic prosperity of the region could be one among the important factors causing the increase in the cost of living in Pune.

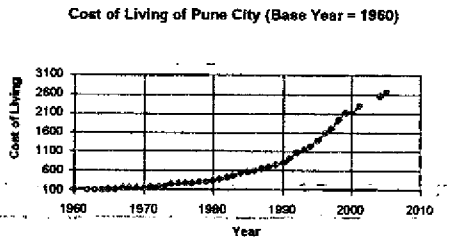

Chart V: Cost of Living of Pune City (Base Year = 1960)

The cost of living has been calculated keeping 1960 as the base year. The vehicles on road are also increasing linearly through the years. The number of motor cars has also gone up significantly as shown on Chart VI. The alarming picture is that of the number of two wheelers. Actually, the city was earlier referred to as the city of two wheelers. Though official data may not be available, Pune is said to be one among the Indian cities with high number of ladies traveling on two and four wheelers.

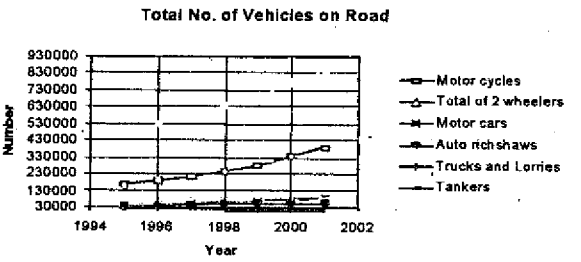

Chart VI: Total No. of Vehicles on Road

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This also speaks of the high quality of city life that the city enjoys. Roads are known to be safe to travel even during late hours due to the fact that the crime rate is relatively low. The employment exchange statistics though not exactly reflecting the data on the actual number of employed persons, the figure would be much on the higher side (refer to chart VII).

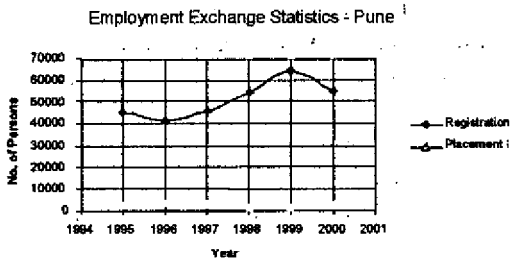

Chart VII: Employment Exchange Statistics - Pune

Why Pune has been selected as a dynamic city region?

Pune is a major industrial center in India, particularly for automobile manufacturing. It is home to one of the world's largest two-wheeler manufacturers – BAJAJ. TATA also has its plant here. Daimler-Chrysler also has an assembly line for its Mercedes Benz brand. Whirlpool has an appliance manufacturing plant near Pune.

Pune also has a burgeoning software industry. Many of India's major software players such as TCS, Infosys, Wipro and Global majors like SAS, VERITAS Software, and BMC have a major presence in Pune.

With the construction of the six lane Mumbai-Pune Expressway, this city is now less than a three hour drive from Bombay. These days people come for a meeting to Pune in the morning and go back in the evening comfortably. The six-lane, 95-km Mumbai-Pune Expressway has certainly been a 'concrete' milestone in cementing the distance between the two cities.

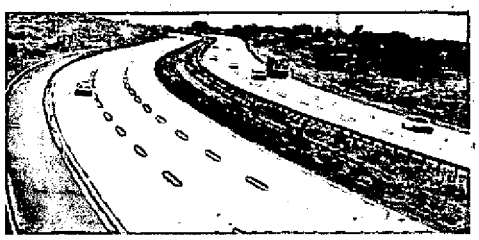

Figure 1: Mumbai-Pune Expressway 1

It is primarily during the last three decades that one sees so many companies turning to Pune. Total investment in industry and related activities in the post liberalisation era were estimated to be Rs 52,000 Crore[2]. The reason being the core competencies Pune offers, i.e. proximity to Mumbai and well-qualified talent, abundant skilled IT manpower and better living standards, to name a few. Certain restrictions imposed by the state government on industrial expansions in Mumbai have also been one of the key drivers for rapid industrialization in Pune.

Pune's proximity to Mumbai, India's commercial center with a seaport and an international airport makes it a favourable destination for commercial activities. It has significant opportunities to emerge as a global player in specific sectors with focused strategic planning. Today, Pune is the seventh largest industrial metro of the country. As well, Pune is the second largest city in Maharashtra and a thriving industrial center with a population of nearly 2.5 million. Some of the country's most prestigious industries are located in Pune. The Pimpri-Chinchwad-Bhosari industrial complex is claimed to be one of the largest in the country. Many

[2] Crore = 10,000,000

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factors helped Pune to develop as a dynamic city-region. These includes Pune Industrial Base, Infrastructure, Local and National Government Policies, Incentives and Resources, Support Institutions, the Government Entrepreneurship, Environmental Issues, Innovations and Learning Systems. These factors are discussed in detail on the following pages.

Post liberalisation of Indian Industry has seen the springing up of about 1044 units, which qualify to be termed as large-scale industrial units. As many as 100 of these projects could be termed as mega-projects with investments of over Rs 16,000 Crore.

Recently, the IT industry has been viewing Pune to be a better prospect over Bangalore, because of abundant brain power and IT maturity. Pune has attracted around 43 per cent of the industry in this sector and is obviously the preferred choice over Bangalore in the years to come. Even the State Government has chosen Pune city as a prominent centre for development of IT looking at the industrial growth in and around the city and the excellent international standard and educational facilities are available. The centre for development of advanced computing (C - DAC), which is one of the premier institutes in the country in the IT is also located at Pune. In addition MIDC is coming up with a Talegoan High-Tech Park to support Pune's existing strong base of R&D institutions, information technology (IT) & bio-technology (BT) companies.

Pune already scores a point in regard with the presence of many software companies in this city. Some of the major companies that are already harnessing the IT potential of the city are: Infosys Technologies Ltd, Wipro Ltd, Satyam Computers, Tata Technologies, Kanbay Software (I) Pvt Ltd, Magic Infotech (I) Pvt Ltd, Varitas Software (I) Pvt Ltd, Cognizant Technology Solutions (I) Ltd, Geometric Software Solutions Pvt Ltd, KPIT System Ltd, Patni Computers, Mahindra British Telecom Ltd and Kalyani Group's Synise Technologies. Pune's skyline is increasingly getting decorated with such companies. With the development of large industrial areas within a radius of 50kms, having Pune as the nucleus, the city is now increasingly surrounded by industrial areas. This, essentially, signifies the all-round development of the local population in terms of better and improved job opportunities, scope for starting ancillaries and living an improved standard of life.

Growth of Auto and Auto Component Manufacturing Industry

The main focus of this study is around the auto component manufacturing industry in Pune. It is imperative to discuss the background of the industry. As discussed earlier, Pune has been growing as an important industrial base for more than a century. Therefore, selecting Pune as the manufacturing location for some of the major auto giants was natural. The year 1945 is important as both BAJAJ Auto and TATA Motors were established in this year.

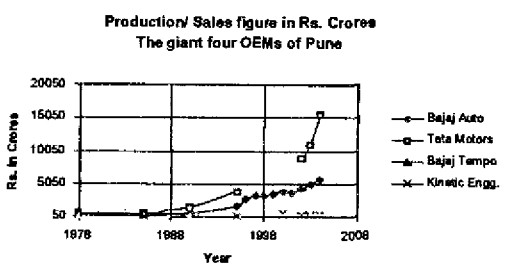

Chart VIII: Production/Sales figure for the giant four OEMs of Pune, in Rs. Crores

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Through large scale ancillary and vendor development efforts of the auto giants in Pune which, also include BAJAJ Tempo and Kinetic Engineering, the auto component manufacturing companies got a boost to establish their factories in Pune. Gradually, Pune as an auto manufacturing city could place itself firmly. Chart VIII projects the boost in production/ sales figures. Data indicates production figures in Rs. Crores till 1995, beyond this year the data indicate sales turnover for the four auto giants based at Pune. Apart from these key players, some of the world's biggest names in Automobiles located in Pune. These are:

- Mercedes Benz (Daimler Chrysler), Pune
- Fiat, Mumbai and Pune
- John Dierre, Pune

Tata established a cluster called the Tata Auto Component at Pune which include companies like:

- Tata Yazaki
- Tata Toyo
- Tata Nifco Fasteners
- TC Springs
- Tata Yutaka

Also in Pune, there are other companies that represent joint ventures and indicate foreign participation, namely:-

- Keihin Fie, Pune
- Lucas TVS, Pune
- Honeywell Garret, Pune
- Cummins, Pune
- Carraro, Pune
- Motherson Sumi, Pune
- Minda Stoneridge, Pune

There are other big names in Auto Component manufacturers of repute due to their excellence in Qulity and exports. These include:

- Bharat Forge, Pune
- Kalyani Brakes, Pune
- ZF Steering, Pune
- Wheels India, Pune
- DGP Hinoday, Pune

Top 10 exporters

Company	Exports (Rs lakh) 2001-02	Exports (Rs lakh) 2002-03	% growth	Turnover (Rs lakh) 2002-03	Export-turnover ratio (%)
BHARAT FORGE	11,034.5	27,100.0	145.59	68,100.0	40
MOTOR INDUSTRIES COMPANY	20,223.0	25,464.0	25.92	1,78,580.0	14
VISTEON AUTOMOTIVE SYSTEMS INDIA	26,378.0	22,200.0	-15.84	57,800.0	38
BRAKES INDIA	8,461.0	10,170.0	20.20	56,943.0	18
SUNDRAM FASTENERS	8,173.3	10,000.0	22.35	50,000.0	20
PHOENIX LAMPS INDIA	7,500.0	7,000.0	-6.67	14,650.0	48
MOTHERSON SUMI SYSTEMS	4,371.0	6,660.0	52.37	33,343.5	20
SIGMA CORPORATION (INDIA)	5,300.0	5,600.0	5.66	5,600.0	100
SUNDARAM BRAKE LININGS	4,285.0	5,431.4	26.75	10,170.4	53

Table II: Top 10 Exporters in India
New players, new learning Business World, February 23, 2004

Some of the remarkable achievements of Pune in Auto Segment could be summed up as below:-

- About 70% of the medium and heavy trucks are produced in Pune
- India's only indigenous car producer is located in Pune
- Pune Accounts for 80% of Multi Utility Vehicle output
- Nine out of every ten three wheelers are produced in the Maharashtra state

Expanding overseas

Indian company	Company/plant acquired/set-up abroad	Located in	Size of deal ($ million)
AMTEK AUTO	Smith Jones Inc	US	20
AMTEK AUTO	GWK Group	UK	37
BHARAT FORGE	Carl Dan Peddinghaus GmBH*	Germany	[illegible]
SUNDRAM FASTENERS	Dana Spicer Europe* (Forging unit)	UK	26
SUNDRAM FASTENERS	Sundram Fasteners (Zhejiang)**	China	5

* Plant ** Plant set-up # Approximate

Table III: Expanding Overseas. Source: Auto components Survey: Exports; New Players, New Learning World Business, February 23, 2004

Table III shows performance of some of the Pune based Auto Component Manufacturers in exports, which are among the top 10 auto component exporters in India. Similarly, the growth and opportunities triggered expansion of the programmes overseas. BHARAT Forge was one among the first to take over the Carl Dan Peddinghaus (CDP) of Germany to become world's number two in Forging industry.

The growth in exports have been phenomenal over the years in the country as a whole. Pune also followed closely in terms of increase in exports. Though in terms of the export potential the number may be minimal, the registered rate of growth continued to be good.

Total automotive vehicle production trend in numbers (Projected trends indicated beyond 2005) indicate a significant rise in the demand of two wheelers and particularly in the motorcycle segment. Obviously Pune played a lead role in the two-wheeler and three-wheeler segments.

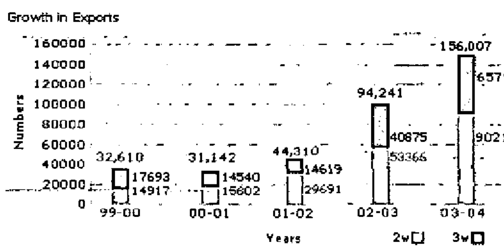


Chart IX: Growth in Export

Auto component industry performance in India as a whole (production in number) for various segments have been projected in Annex IV and Annex V.

Pune being the center of auto production and auto component manufacturer in India would continue to play a leading role. The production trend shown earlier indicate the similar trend for both BAJAJ Auto and TATA Motors. Annex VII shows the trend of country's investment, export and sales in auto component sector. It is clear that in order to meet the projected demand the city and its governance mechanism must play a supporting role to meet this challenging task.


Highway infrastructure in Pune

Infrastructure

Potential opportunities for Business through Land development along the Mumbai-Pune Expressway has been identified by the Maharashtra State Road

Development Corporation Ltd. (MSRDC). Power consumption has been going up as the number of industries and also the population of the entire area has been going up. However, the power generation in the city region and also in the state has not increased to take care of the need. As a result the power situation continues to be grave. Similar problems have been felt in the city infrastructure and facilities particularly in water supply and road. As more and more vehicles are plying up and down everyday, and most of the city roads are facing traffic congestion. This problem is increasingly felt in Pune like other cities though measures have been taken to decongest roads through widening and also by constructing Bangalore by pass to avoid south bound traffic through Pune city. The number of fly-overs is relatively less which may be one of the reasons of the traffic congestion.

There is scope for development of Road Side Facilities like Rest Places, Hotel, Motel, Restaurant, Service Station, Truck Repair and Maintenance Facility, Auto Show Rooms, Convention Centers, Hospitals, Naturopathic and Ayurvedic Centers, Discount Shopping Centers, Multiplex corporate training and conference facilities, Farmers Markets, call centers etc. This would definitely impact the economy of the entire stretch.

General Infrastructure: Pune ranked lowest in infrastructure support according to Gartner Analyst, Dec 13, 2004 Rediff.com. Pune would need significant investment to be at par with cities like Mumbai and Bangalore or even cities like Chennai and Hyderabad in the future. However, Pune tops the list with the highest ratings in skills availability. The study has categorised and evaluated the cities into four tiers based on various factors including infrastructure, skills availability, skills retention, access, cost of living, political support and quality of life. Pune figures in tier 1.1 (refer Figure 2).

Tier 1
Bangalore, Mumbai and New Delhi
Tier 1-1
Chennai, Hyderabad, Pune, Noida, Gurgaon and Navi Mumbai (New Bombay)
Tier 2
Calcutta, Mangalore, Mohali/Chandigarh and Bhopal
Tier 3
Coimbatore, Mysore, Nasik, Koji (Cochin), Nagpur, Jaipur, Indore, Shimla, Raipur, Lucknow, Kanpur, Panaji, Guwahati, Bhubaneshwar, Patna, Srinagar, among others.

Figure 2: City-Tier Categorization. Source: Gartner Analyst, Dec 13, 2004 Rediff.com

The Pune City Region Attractions

During the months of August or September each year, the city celebrates the Hindu festival of Ganesha. The festival culminates in a carnival like procession along the busy throughfares of the city. The city also has an active theater community. It is the birth place of Meher Baba as well as the home of Bhagwan Shree Rajneesh. Rajneesh's Osho Ashram helps bring a very international flair to the city.

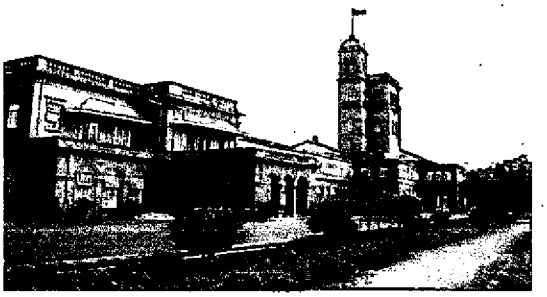
Places of Interest

- Parvati Temple
- Shaniwar Wada
- Aga-Khan palace also famous as Gandhi Museum
- Kelkar Museum
- Kamala Nehru Park
- The art Gallery at Balgandharva Rangamandir

- Osho Rajneesh Ashram
- Sinhagad Fort
- Handmade-Paper Factory
- Lonavala-Khandala hillstation
- Panshet Dam
- Khadakwasala Dam

Industrial base of Pune city and the related region

The major industrial segments in Pune include automobile, machine tools, chemicals, electrical and electronics, instrumentation and control, iron and steel, castings and forgings, telecom, packaging, auto components, material handling equipment, fuel and pumps, etc. A large number of small and medium scale equipment manufacturers produce basic electrical and electronic components, digital equipment, process control and communication equipment, computers and computer accessories, and also software.



Government of Maharashtra State premises in Pune

Industrial Clusters of the city region

In India, industrial clustering has taken place in only certain regions due to some advantages. There are three types of industrial clusters, viz. (i) major industrial regions (ii) minor industrial regions, and (iii) manufacturing districts.

Industrial clusters are identified on the basis of the number of manufacturing units sited in close proximity or the quantum of industrial environment. Amongst these regions; Bombay-Pune, Ahmedabad-Vadodara belt, Madurai-Coimbatore-Bangalore, Hooghly industrial belt and Faridabad-Gurgaon-Ambala, which emerged as the most prominent.

The British also initially developed the Bombay-Pune Industrial Region. They obtained the Bombay island-site for developing a port in 1774. The construction of a 34 km long rail track between Bombay and Thane in April 1853 ushered in an era of developing link with the interior. The routes through the Bhor Ghat to Pune and through Thal Ghat to Nasik actually extended the influence of Bombay towards its hinterland. The opening of the Suez Canal in 1869 provided impetus to the growth of Bombay port.

How did the city region reach its growth?

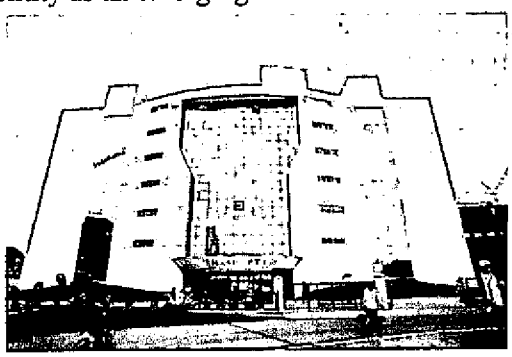
In the census of 1881 there were only eight urban places in the Pune district (Source: Gazetteers department, Government of Maharashtra, Mumbai, 1954). The number rose to 37 in 1951. The percentage of urban to total population rose from 18.5 to 42.8. Needless to say, the density of population went up from 163.4 to 323.7 per square mile. The remarkable growth of the urban as compared to rural numbers could be noted during this period. The population of the Poona urban areas had gone up by nearly 400 per cent. In 1881, Poona City answered for a little over one-

tenth of the population, whereas it answered for more than thirty per cent in 1951. While part of the growing urbanization had been due to concentration of economic activities, the growth of the main city had been contributed to mainly by activities connected with public administration, either of the State or of the Union Government. Both direct and indirect effects of the location of these activities in Pune, on the economic life of the Pune districts had been immense.

The process of urbanization was for the most part being helped by administrative concentration in Pune City, and to a lesser extent in taluka headquarters. Out of Pune city's population of nearly five Lakhs in 1954, nearly half of this population depend on administrative and miscellaneous employment for their livelihood. Non-agricultural industry, however, supports livelihood to one-fourth of the population. Pune was chiefly an administrative city; its industrial life was by no means negligible. Dapodi represented the process of gradual urbanization of villages coming under the sway of a metropolitan city. Though the surroundings of the place were comparatively rural, employment was mostly urban and non-agricultural. The other process is the dwindling of villages. This process was represented by Sirur, the population of which place had gone down by over 48 percent during 1900 to 1950. Considering that the place had lost its administrative prestige because of the abolition of the cavalry, for which it used to supply fodder, one would naturally be prepared to expect a decline. The frequent droughts from which the taluka had suffered also depressed the economy of the place.

Major Industrial Sectors contributing to Pune's dynamic growth

Pune's skyline speaks a lot about its assuming a new identity as an emerging industrial metro and potential manufacturing hub. Large companies like TELCO and BAJAJ had set up their base in Pune. Such companies gave rise to the ancillaries, and then multi-national engineering companies like Sandvik, SKF, Alfa Laval, Sulzer, Mercedes Benz, Burckhardt and many other engineering companies started here in Pune. The strong presence of the Auto OEMs[3] and the Auto Component Manufacturers (ACMs) has always made Pune as a favorite destination for Auto industries. However, its growing presence in IT has also recently made it a favorable destination for IT.



The Center for Development of Advanced Computing (C-DAC)

Pune has attracted around 43 per cent of the IT industry and is obviously the preferred choice over Bangalore in the years to come. Even the State Government has chosen Pune city as a prominent centre for development of IT looking at the industrial growth in and around the city and the excellent international standard and available educational facilities. The centre for development of advanced computing (C - DAC), which is one of the premier institutes in the country in the field of IT is also located at Pune. Facilities such as the technology up-linking and infrastructure data centres are located in Pune. The Software Technology Parks (STPI) is also located here in Pune. However, Pune already scores a point in regard with the presence of many software companies. Some of the major companies that are already harnessing the IT potential

[3] Original Equipment Manufacturers

of the city are: Infosys Technologies Ltd, Wipro Ltd, Satyam Computers, Tata Technologies, Kanbay Software (I) Pvt Ltd, Magic Infotech (I) Pvt Ltd, Varitas Software (I) Pvt Ltd, Cognizant Technology Solutions (I) Ltd, Geometric Software Solutions Pvt Ltd, KPIT System Ltd, Patni Computers, Mahindra British Telecom Ltd and Kalyani Group's Synise Technologies.

Means of Livelihood of some urban areas (1951):

Table VI shows the relation between the population and different economic activities living in urban areas in Pune Division while table V shows the means of Livelihood in Pune Division.

Name of city	Percentage of population dependent on			
	Industry	Agriculture	Rent.	Services & Miscellaneous
Poona City	25.0	2.6	0.5	47.0
Baramati	18.0	9.0	0.7	43.0
Kalamb	62.6	15.8	0.6	14.7
Khed	8.0	65.0	2.3	15.6
Dapodi	42.0	3.0	0.1	49.0
Sirur	16.0	8.0	1.0	41.8

Table VI: Means of Living of Pune and surrounding areas.
Source: Gazetteers department, Government of Maharashtra, Mumbai, 1954

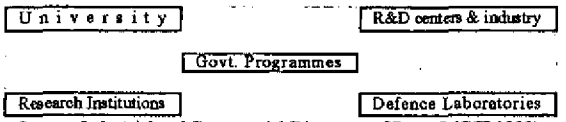
	AGRICULTURAL				
Item	Owner cultivation	Other cultivation	Cultivating Labour	Rent.	Total.
Total Population 1951-1950-1976	8-64-031	39-788-NA	80-253-NA	36-964-NA	10-21-036
Percentage (1951)	44.3	2.0	4.1	1.9	52.3
Percentage (1901)	....	...	...	...	60.0
	NON-AGRICULTURAL				
Item	Production	Commerce.	Transport	Services & Misc.	Total.
Total Population 1951-50-76	2-67-264	1-48-273	52-928	4-61-475	9-29-940
Percentage (1951)	13.6	7.7	2.7	23.7	47.7
Percentage (1901)	16.0	3.0	2.0	19.0	40.0

Table V: The means of Livelihood in Pune Division:
Source: Gazetteers department, Government of Maharashtra, Mumbai, 1954

The growing urbanization of the district was accompanied by a shift from agriculture to non-agricultural employment as the principal source of livelihood for the population. During the last half of the nineteenth century the percentage of population dependent on agriculture had been reduced from 60 to 52, and those dependent on the industry, including artisan industry, from 16 to 13.6. On the other hand, the percentage of population dependent on commerce had increased from 3 to 7.7, and that on services and miscellaneous employment increased from 19 to 23.7.

The Process of Governance

In view of the city's significant role played in the area of Auto, Auto Components, IT and other segments it becomes important to examine the governing mechanism which drives the development and decision making relating to supporting infrastructure, facilities and environment to support and sustain Pune economic growth.



Source: Industrial and Commercial Directory of Pune (MCCI 1990)

Diagram I: Interplay of Governmental Bodies at Pune

The process of interaction among various national, state level bodies and association, both government and non-government, some have been listed earlier, need to be examined to foster the required support mechanism. This mechanism needs to evolve and lead to solving process problems for triggering action in order to address needs of auto component manufacturing companies apart from others. Diagram I shows the interplay of such bodies and associations in the early part, till 1990, of Pune city's development. It would be interesting to note that the increase in the population growth, city area growth as well as the vehicle manufacturers growth (refer to facts and findings of the city region) all have registered a significant increase after 1990 which coincides with the beginning of the reformation process in 1990 for the nation as a whole.

Based on the interaction with various persons both at industry, associations and government bodies, this mechanism of governance of the auto component manufacturers could be explained by the model presented. The Auto Component Manufacturers (ACM) is by and large driven by two groups of OEMS; one group which is located at Pune and the other group, which is located outside Pune. These OEMS basically drive the productivity, quality, cost, delivery and other aspects of the products manufactured by the auto component manufacturers. They also influence the managerial practices through periodic audits and assessment processes. Most of the Pune based ACMs have been members of vendor development activities initiated by OEMS like Maruti, Tata Motors, Bajaj, etc.

These activities drove organizational excellence, both managerial and product/process across the ACM companies.

Bajaj Auto	Areas	Collaborator/ tie-ups
1984	Motorcycles	Kawasaki Heavy Industries Ltd, Japan.
1995	Diesel Engine for 3 Wheelers	Kubota Corporation, Japan
1995	Scooter Development	Tokyo R&D Co. Ltd. Japan.
1996	Scooters	CAGIVA Motor spa Italy.

Table VI: Baja Auto Areas of Development

The growth of the ACMs depend on the ability of these companies to achieve lower manufacturing costs and quality excellence apart from other basic factors like delivery, product development, etc.

Bajaj Tempo[4]	Areas	Collaborator/ tie-ups
1996	Hydraulic valves	Robert Gmbh, Germany,
1996	Germany Cargo velids	ZF Passau Gmbh
1995	Brake Caliper	Wabco Perrot Bromsen , Germany

Financial Tie up—Daimler Chrysler, Germany, Foreign equity 16.8%

Table VII: Baja Tempo Areas of Development

[4] 3 wheeler in collaboration with Vidal & Sohn temp Werke, Germany

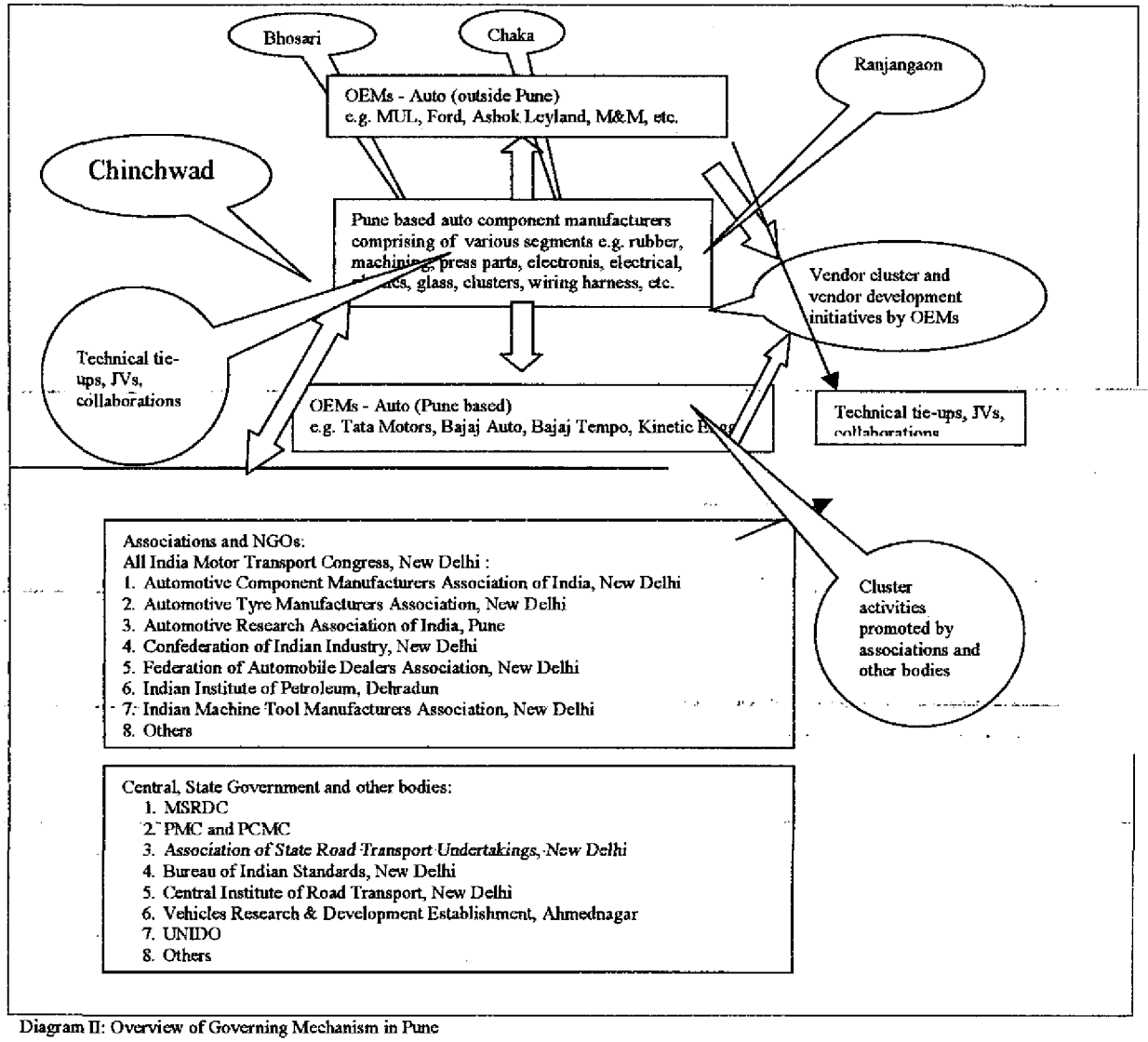


Diagram II: Overview of Governing Mechanism in Pune

It could be seen on Annex VII that the growth of the auto component manufacturers (production), auto component industry investment and the growth of the Auto Exports are similar. This trend could be seen in most of the cases except few cases where the ACMs have aggressively marketed their product abroad or acquired companies outside to boost their export targets.

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One example of such company is Bharat Forge, Pune which figured as one of the top ten exporters among the ACM companies. The joint ventures and technical tie-ups often triggered the expansion and development of new technologies in the ACM companies with the foreign counterparts of The OEMS.

TATA Motors	
92-93	AVL list Vmbh, Austria, Development of people & Diesel Engines
93-94	Sclaudt Maschi nenbau Gmbh, Germany CNC cylindrical grinding m/cs
95-96	Robert Bosch Gmbh , Germany, EMS for petrol engine
95-96	LDEA Institute, Italy Design & body styling of small cars
96-97	Nachi - Fujikoshi Corporation, Japan Robots
96-97	Le Moteur Moderne, France, development of diesel & petrol engine for small cars
Since 1996	Institute of development in Automotive for Tata India and its variants /design of body for small cars and its variants
Since 1996	Le Moteur Modeme, France, Engines for passenger cars Design & development of diesel & petrol engine

Table VIII: TATA Motors Cooperation Development with Foreign Companies

This could be noted in case of TATA Motors, BAJAJ Auto, kinetic Engineering and BAJAJ Tempo. Examples of such collaborations and technical tie-ups could be sited from all the four major OEMs who have contributed in a significant way to Pune ACMs growth.

Kinetic Engg.	Hyosung Motor, South Korea, 125cc & 150 cc 4 stroke motor cycles
Kinetic Motor	1986 Honda motor company ltd. Japan, scooter

Table IX: Kinetic Eng. & Kinetic Motors Cooperation Development with Foreign Companies.

Most of the ACM companies are also members of the associations in their respective sectors, e.g. rubber, plastics, machine tools, etc. They are also members of the local chapters like Mahratta Chambers of Commerce and Industries (MCCI)-Pune, Confederation of Indian Industry (CII)-Pune, etc. These chapters and associations interact with the central, state and other institutions like National Chemical Laboratory (NCL), Pune University, Pune Municipal Corporation (PMC), Maharashtra State Road Development Corporation Ltd. (MSRDC) to bring forward their requirements. In order to understand the structure of such associations, it is appropriate to discuss in detail – ACMA as an example.

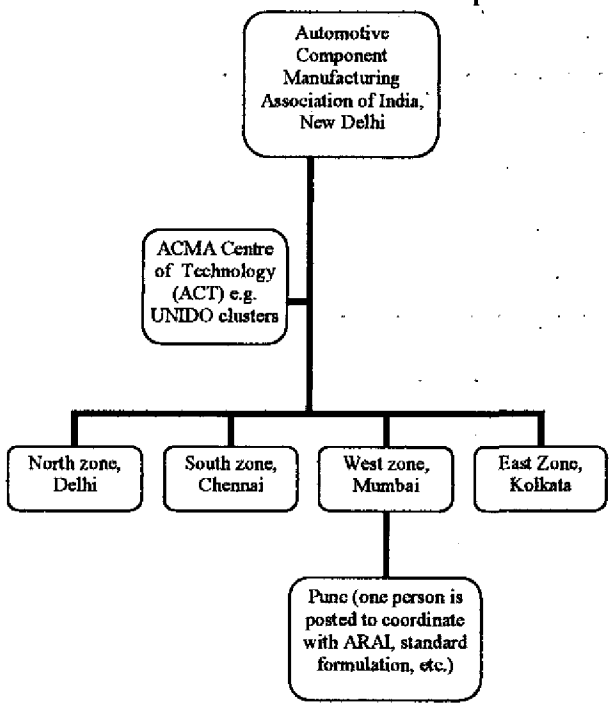

Diagram III: The ACMA Pune Chapter

The example of ACMA (Automotive Component Manufacturing Association) is taken up for this purpose. While the central chapter in

Delhi has taken up policy, other matters with center and other associations, the local chapter works through the regional office located at the four regions of India. Pune chapter is attached to Western Zone. One person attached to Pune works along with Automotive Research Association of India (ARAI) and other bodies to drive standard formulation, etc.

ACMA has a president and vice president who are elected every year. It has an executive committee in which there are members who are both elected and co-opted. Every region has a regional chairman. All forty-five Pune-based ACMA members are part of western region at Mumbai.

Therefore, the governing mechanism of the city follows a typical top down-bottom up approach where many proposals and recommendations would flow from the organisation through the associations to the regional or state counterpart. From the state or regional counterpart it would flow to the apex body, then to the appropriate government or non-government body for an appropriate action. According to some experts, companies like Telco and Bajaj have contributed to the infrastructure development, by ensuring that there is enough pressure on the local administration to see that things are up to the mark. While this is a typical way the bottom-up or lateral efforts work, there are other cases of top-down approach where a proactive decision is taken considering the emerging issues or the futuristic projections.

Initiatives also are taken up through central, state and local bodies to bring about changes in the policies, structures and creation of facilities and promoting incentive schemes for planned developments. Development of economic zones, developing IT, BT parks, making of the fly-overs, conversion of express highway to green zone are examples of such planned initiatives. Maharashtra Industrial Development Corporation (MIDC) was instrumental in bringing the development of a large industrial area of 4,000 acres at Bhosari, which brought about a number of industries, small and big to concentrate in this area. The Pimpri-Chinchwad-Bhosari industrial complex is claimed to be one of the largest in the country.

Realizing the inclination of IT industry towards Pune, the Pune Municipal Corporation (PMC) is promoting Pune as a favourable IT destination. PMC with the director of industries has announced special benefits to attract and facilitate the entry of this industry in Pune. A separate zone has been allotted, speedy clearances and infrastructural facilities are being offered for these projects. In addition MIDC is coming up with a Talegoan High-Tech Park to support Pune's existing strong base of R&D institutions, IT & BT companies. Ernst & Young is assisting MIDC in identifying a strategic Joint Venture (JV) partner to develop the park. This will help lure many new companies from India and abroad to patronize Pune, as it's IT destination in the near future.

Policy Issues

The following points were reviewed by the governmental related bodies, where policy measures were considered:

Electrical Power problems: Lack of electrical power seems to be the main issue today. Regular load shedding and shut-downs in Maharashtra have started crippling the infrastructure.

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Roads: The situation of internal roads is also a major issue. Most of the roads at the peak hours are not able to take the traffic. Though road widening plans are being taken up but looking at the increase in the number of vehicles, this could be a major issue. Also, the worsening condition of roads during the rainy seasons every year is a matter of concern for city life and industry. Inadequate and poor quality of road surface leads to increased Vehicle Operation Costs and also increased pollution. It has been estimated (source: SIAM) that improvements in roads will result in savings of about 15% of Vehicle Operation Costs.

Traffic on roads is growing at a rate of 7 to 10% per annum while the vehicle population growth for the past few years is of the order of 12% per annum. Poor road infrastructure and traffic congestion can be a bottleneck in the growth of vehicle industry. A balanced and coordinated approach needs to be undertaken for proper maintenance, upgradation and development of roads. Incentives need to be declared for encouraging private sector participation in these areas. Also, latest technologies and management practices are needed to take care of the increase in vehicular traffic. For the convenience of the public traveling, the Government proposes to promote multi-modal transportation and implementation of mass rapid transport systems.

Pollution and environmental issues:
With the number of vehicles going up and the cost of living as well as the number of industries going up, the pollution level of the city is also going up in several areas. Research and Action in Natural Wealth Administration (RANWA), Pune, has studied the carbon sequestration capacity of Pune.

The results of these studies were mapped for each sq. km. grid according to the consumption pattern of various economic groups and tree cover density respectively. The study reveals that only 2% of the total 7.8 Lakh tons of Carbon emitted into the atmosphere each year can be trapped by trees, while the remaining 98% overload contributes to global warming. Rich people generate 34% of above emission with per capita emission, which is eight times that of the poor. The low sequestration areas of Pune are by and large concentrated around North-West, South-East and South-West. This may be attributed to the emergence of residential areas in these parts of Pune.

With the increasing traffic, the air pollution becomes a major threat in the city life. Though in the major traffic areas the awareness in terms of pollution is much better than before due to display of pollution levels everywhere. The levels are alarming in many of the place. According to 'Research and Action in Natural Wealth Administration', RANWA the low sequestration areas of Pune are by and large concentrated around North-West, South-East and South-West parts. As far as carbon emission is concerned, the middle class citizens produce 265.92 Kg of emission per capita per year. Most of the city areas are occupied by the middle class population. This indicates that, there is a need to take priority action to contain the same. For example, promoting tree plantation as a mitigation measure, is imperative to curtail the consumption of rich citizens by a quarter of the present emission. Some of the solutions forwarded by RANWA, Pune include switching from private transport to public transport as well as minimizing the use of consumer goods that are vigorously categorized by the global measures as goods that negatively affecting the environment.

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According to the Auto Policy of Government of India (ref. annexure AI), efforts are underway to assist development of vehicles propelled by alternate energy sources. Development and introduction of vehicles propelled by energy sources other than hydrocarbons through promotion of appropriate automotive technology would certainly bring much desired change. Hybrid vehicles and vehicles operating with batteries and fuel cells are alternatives to the conventional automobile. These are however, still in their early stage of technological maturity. As an impetus for the development of such vehicles, an appropriate long-term fiscal structure need to be put in place to facilitate their acceptance vis-à-vis vehicles based on conventional fuels.

Other aspects related to policy, which would directly impact the environmental conditions, include use of low emission fuel auto technology. Recommendations have been made by Expert Committee on Auto Fuel Policy headed by Dr. R.A. Mashelkar to approve a road map for implementation for the auto fuel quality consistent with the required levels of vehicular emissions norms and environmental quality. Government of India has decided to formulate a comprehensive auto fuel policy covering the related aspects and ensure availability of appropriate auto fuel/fuel mixes at minimum social costs across the country.

Currently, India is behind Euro norms by few years, the adaptation is already in progress and emission norms are being aligned with Euro standards and vehicular technology is being accordingly upgraded. Vehicle manufactures are also working towards bridging the gap between Euro standards and Indian emission norms.

In the year 1996, the Ministry of Environment and Forests formally identified the required fuel specifications. Maximum limits for critical ingredients like Benzene level in petrol have been specified only recently and a limit of 5% m/m and 3% m/m has been set for petrol in the country and metros respectively. The high levels of pollution have necessitated eliminating leaded petrol, through out the country (Source: SIAM). To address the high pollution in 4 metro cities 0.05% sulphur petrol & diesel has been introduced since 2000-2001. The benzene content has been further reduced to 1% in Delhi and Mumbai.

Water: As the city is located at the confluence of two rivers, Mula and Mutha, water situation as it is not very alarming at the moment. But due to constant use of the bore well for construction as well as for household purpose, the ground water level is going down. This could be a major problem. The city needs a firm policy on maintaining ground water level. Policies on rainwater harvesting could help the city in this direction.

Inspection & Maintenance (I&M) Of In-Use Vehicles: It has been estimated that at any point of time (Source: SIAM) new vehicle comprise only 8% of the total vehicle population. In India currently only transport vehicles, that is, vehicles used for hire are required to undergo periodic fitness certification. The large population of personal vehicles is not yet covered by any such mandatory requirement. In most countries that have been able to control vehicular pollution to a substantial extent, Inspection & Maintenance of all categories of vehicles have been one of the chief tools used. Developing countries in the South East Asian region, which till a few years

back had severe air pollution problem, have introduced the I&M system and also effective traffic management.

Auto policy of Government of India has made provision for automatic approval of foreign equity investment up to 100% of manufacture of automobiles and component. However, other issues related to land, water, tax, labour, etc.; need to be addressed in a more congenial manner to make the investment process simpler and attractive.

Incentives and resources

- General incentives
- Sector specific incentives

General incentives

According to the industrial policy of Maharashtra 2001 (Source: Ministry of Small Scale Industries, Government of India), the new established industries on areas categorized as C, D, and D+ will be exempted from payment of Electricity Duty for a period of 15 years.

Government of Maharashtra proposes to promote Education and Research Institutions of international or national standards, including world-class business education institutions, by providing land in industrial areas/estates at nominal or concessional rates. This should encourage (subject to the real-term benefits and value that one sees out of the investment) set up of quality institutes and research organizations. Qualitatively this should have an impact on the governing mechanisms related to the industry.

Sector specific incentives

In other parts of the State, 100% Export Oriented Units (EOUs), Information Technology (IT) and Bio-Technology (BT) units, and industries setting up in Special Economic Zones (SEZs), and Electronic Hardware Technology Parks will be exempted from payment of Electricity Duty for a period of 10 years.

New Industrial Townships: More recently, these concepts were extended through statutory amendments to enable the establishment of independent Industrial Townships. In the first phase, self-governing Industrial Townships with the power to raise resources and determine their application will be established in industrial areas being developed by Maharashtra Industrial Development Corporation (MIDC) at twelve locations across the State, i.e. at Vile-Bhagad (Raigad), Airoli (Thane), Talegaon (Pune), Hinjewadi - Man (Pune), Shendre (Aurangabad), Additional Latur (Latur), Nandgaon Peth (Amravati), Additional Yavatmal (Yavatmal), Tadali (Chandrapur), Butibori (nagpur), Additional Sinnar (Nashik) and Nardhana (Dhule). The industrial townships so set up will pay 25% of their revenue to the concerned Gram Panchayat(s) or local bodies for the initial period of 5 years.

Promotion of Education and Research Institutions: Educational and research institutions of international or national standards, including world-class business education institutions, would be provided land in industrial areas/estates at nominal or concessional rates.

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Support Institutions and Organizations

Pune has many institutions of higher education, including the University of Pune, several colleges of engineering, Inter University Center for Astronomy and Astrophysics (IUCAA), National Chemical Laboratory (NCL) and the Armed Force College. The National Defense Academy trains officers of India's armed forces. It is located at Khadakvasla, on the outskirts of Pune. Fergusson College is one of the most important colleges in Pune. It was established in 1885. Students from all over India, and many African countries come to Pune for higher education, particularly engineering and management. Pune is rapidly becoming a major centre of Information Technology in India. With numerous engineering and management institutes it was once called "Oxford of the East" by Jawaharlal Nehru, India's first and longest serving Prime Minister.

The following universities and high institutes are located in Pune:

- University of Pune
- College of Engineering, Pune
- Symbiosis Institute of Business management
- Maharashttra Institute of Technology
- Vishwakarma Institute of Technology
- Fergusson College
- Pune Institute of Computer Technology
- Symbiosis Institute of Computer Studies and Research

Some of the Research Institutes:

- National Chemical laboratory
- Inter University Center for Astronomy and Astrophysics
- Bhandarkar Institute of Oriental Research
- Agharkar Research Institute

Some of other Government, State Government, Non-Government Bodies connected to development of Pune City Region:

- Pune Municipal Corporation
- Pimpri Chinchwad Municipal Corporation
- Maharashtra Industrial development Corporation
- Maharashtra State Electricity Board
- Software Technology Park of India
- University of Pune
- Centre for Development of Advanced Computing
- Other local, National and International associations
- Secretary (Industries), Government of Maharashtra
- Development Commissioner (Industries), Maharashtra
- Directorate Of Industries, New Administrative Bldg., 2nd Floor,
- Maharashtra Industrial Development Corporation (MIDC)
- Maharashtra State Financial Corporation (MSFC)
- Maharashtra State Electricity Board (MSED)

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- City and Industrial Development Corporation Of Maharashtra Limited (CIDCO)
- Maharashtra State Road Development Corporation Ltd. (MSRDC)
- Maharashtra Small Scale Industries Development Corporation Ltd. (MSSIDC)
- Software Technology Park Of India
- Centre For Development Of Advanced Computing (C-DAC)
- Department Of Telecommunications Maharashtra Telecom Circle,
- Maharashtra Pollution Control Board (MPCB)
- Maharashtra State Khadi & Village Industries Board (MSKVIB)
- 19-21, Manohardas Street, Fort,
- Maharashtra Tourism Development Corporation (MTDC)
- Maharashtra Centre For Entrepreneurship Development (MCED)
- All India Motor Transport Congress, New Delhi
- Association of State Road Transport Undertakings, New Delhi
- Automotive Component Manufacturers Association of India, New Delhi
- Automotive Tyre Manufacturers Association, New Delhi
- Automotive Research Association of India, Pune
- Bureau of Indian Standards, New Delhi
- Central Institute of Road Transport, New Delhi
- Confederation of Indian Industry, Pune
- Federation of Automobile Dealers Association, New Delhi
- Indian Institute of Petroleum, Dehradun
- Indian Machine Tool Manufacturers Association, New Delhi
- Vehicles Research & Development Establishment, Ahmednagar
- Automotive Component Manufacturing Organisation

Entrepreneurship and Training

Entrepreneurship and training are two fundamental pillars of corporate life. Pune city for some time now has promoted both in various ways and means.

One such example is Pune – Bremen Cooperation through Maharatta Chambers of Commerce and Industries (MCCI). Bremen is one of the important industrial city-port of West Germany. At the initiative of the chambers of commerce in both cities, a memorandum of understanding was signed between the MCCI, Pune and Bremen chambers of commerce, West Germany. This Memorandum of Understanding (MOU) was made to explore new avenues for exports from Pune region to market products to Germany through the assistance provided by Bremen chambers of commerce. These efforts were made to promote exports. An importer's delegation from Bremen to Pune was also organized to help selection of products for export to Bremen. The MOU also considers training of exporters from Pune as well as provision of variety of services to the entrepreneurs from Pune etc. Not only commercial contacts be strengthened through such effort but it had also created a platform for the citizens of these two premier cities to exchange and share valuable information about the economic history, and culture of each city.

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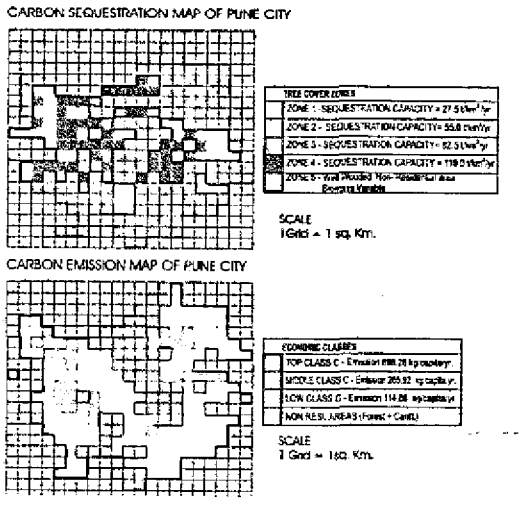
Pune based ACM companies derived direct help in the form of training as well as towards better entrepreneurship through programmes organized by ACMA. JETRO (Japan External Trade Organization) provided the necessary support.



Map II: Carbon Sequestration and Carbon Emission of Pune City

JETRO is a government-related organization that works to promote mutual trade and investment between Japan and the rest of the world. Originally established in 1958 to promote Japanese exports abroad, JETRO's core focus in the 21st century has shifted towards promoting foreign direct investment into Japan and helping small to medium size Japanese firms to maximize their global export potential. Local sourcing and procurement of parts and materials is of obvious importance to Japanese automakers seeking to maximize their cost-efficiency and global competitiveness. JETRO is actively involved in nurturing supporting industries, such as machining, mold and die technology, press working, plastic molding and related industries in areas where Japanese industry is concentrated (primarily Asia, Mexico and South America). JETRO does this by dispatching specialists to these areas to work with local companies and organizations, providing them with technological guidance and training. These efforts help minimize the number of defective products and expand local business opportunities.

Two such visits have been made from JETRO experts to help Auto Component Manufacturers in the area of Sheet Metal and Press Parts. These visits have been organized through ACMA.

Innovation and learning – ACM companies

Innovation and learning are integral parts of the governing mechanism. Without the innovation and learning mechanism important breakthroughs cannot take place in the development process.

Auto Cluster development in Pune city-region:

One such example of innovation and learning mechanism could be sited by the auto cluster development initiative in the Pune city region to improve the image, efficiency and effectiveness of the cluster companies. This scheme was envisaged to strategically convert static local efficiency into dynamic competitiveness by:

- Promoting innovation and collective learning.
- Creating suitable customized infrastructure support and service network.
- Promoting product design and development through focused support and association with specific R&D institutions.
- Assisting the units in setting up /developing common facilities like testing facilities, design centers, information hub etc.

- Assisting appropriate technology transfer, information sharing and quality improvement.

Established under the Industrial Infrastructure Upgradation Scheme (IIUS) of the department of Industrial policy and promotion, Ministry of Commerce and Industry, Government of India, Auto Cluster is the first of its kind set- up in the Pune zone. Auto Cluster project is located in the industrial areas of Pimpri-Chinchwad-Pune. The host to some of the important names in the automobile sector.

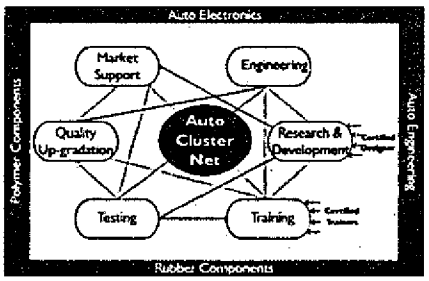


Diagram IV: Auto Cluster Network of Pune

The auto components manufacturers including rubber and polymer associations had joined hands in the promotion and development of this cluster. Institutes including engineering colleges, R&D institutes, component manufacturers and their associations, Banks, Financial Institutions and various Government Agencies have become involved in this project. Auto Cluster targets industries like CAD/CAM, Polymer, Auto Electronics, Auto Engineering, Rubber components and general engineering sectors.

Small Industries Cluster Development Programme: The Ministry Of Small Scale Industries' new thrust:

Keeping in view need to launch a broad-based participative Cluster Development Initiative with a holistic approach, an earlier scheme of the DC (SSI) has been renamed "Small Industry Cluster Development Programme". The Ministry is now set to start a large number of Cluster Development initiatives across the country. The DC (SSI) has selected twenty-one clusters in July 2003 for cluster development out of the 358 Indian SSI Clusters surveyed and listed by UNIDO. Discussions have been held with State Governments, local Industries Associations, Financial Institutions and other organizations involved in the promotion of SSIs while selecting the clusters. It is now proposed to select 20 more clusters in near future for development under the same programme. Pune figures among the list as a region for promoting Automotive Cluster to address the objectives mentioned earlier. This cluster has almost come to the end of its projected period with satisfactory results achieved in most of the factors originally listed as part of the objectives of the automotive cluster companies.

The process for cluster development programme is implemented through the following steps:

- Selection of the Cluster,
- Selection of a Cluster Development Agent,
- Diagnostic Study,
- Preparation of Action Plan for intervention,
- Approval of the project and release of funds through leveraging,
- Implementation of Trust Building between Cluster Actors and Cluster Development Agent, and also among Cluster Actors,
- Monitoring and Evaluation, and
- Self-Management Phase.

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The credit needs of the clusters were met through cluster based credit plans (source: Ministry of Small Scale Industries, Government of India). A high level meeting to review disbursement of Credit to SSI Sector was held in June, 2003 under the chairmanship of Deputy Governor, Reserved Bank of India (RBI) attended by Secretary of (SSI) and top officials of major Banks. In the meeting, it was decided that RBI will seek Ministry of SSI's advise regarding 60 SSI clusters to be identified for focused development of SSI's. It was also decided that RBI would disseminate the list of such clusters to all public sector banks for initiating further necessary action and incorporating their credit requirements in State Credit Plans. At the State Level Bankers Committee (SLBC) level, a sub group of bankers and the State Government officials is being set up to resolve various issues arising on financing the clusters and to report the development of SLBC. This is a typical example of innovative and learning mechanism to bring about development in the companies through central, state and local interfaces.

Small Industries Development Organization's (SIDO) publications on Cluster Development highlight the various initiatives taken by different agencies for promoting cluster development. One of the key discussion subjects on clusters is the promotion of public-private partnership for building up requisite infrastructure in clusters. While public component financial support is available through various schemes of Government, innovative financing methods including SPVs, BOT, long-term bonds etc. need to be explored to catalyse the private component. Monetary returns on such infrastructure will be an important prerequisite for attracting private capital.

New Industrial Townships:
Government of Maharashtra has made statutory amendments to support the establishment of independent Industrial Townships. Self-governing Industrial Townships with the power to raise resources and determine their application will be established as the first step in industrial areas being developed by MIDC at twelve locations across the State, i.e. at Vile-Bhagad (Raigad), Airoli (Thane), Talegaon (Pune), Hinjewadi - Man (Pune), Shendre (Aurangabad), Additional Latur (Latur), Nandgaon Peth (Amravati), Additional Yavatmal (Yavatmal), Tadali (Chandrapur), Butibori (nagpur), Sinnar (Nashik) and Nardhana (Dhule). The industrial townships so set up will pay 25% of their revenue to the concerned Gram Panchayat(s) or local bodies for the initial period of 5 years.

The self-governing rules of generating resources and determining application would primarily decide the effectiveness of this initiative. This is a good initiative to bring empowerment at the local level. In Pune, Talegaon and Hinjewadi locations would benefit from this facility.

Bharatiya Yuva Shakti Trust (BYST), Pune help the tiny sectors based at Pune to take up businesses, which are mentored by professionals from industry with adequate qualifications. BYST provides loan at low interest rates and also guides the tiny sector people to pursue their business successfully. BYST develops entrepreneurs by providing young disadvantaged people in India with loans against no collaterals and a business guru. BYST chapter in Pune has been effectively carrying out this programme for several years now. According to BYST, the concept of entrepreneurship development began taking roots in Pune. The business community both nationally and internationally started realizing that entrepreneurship development is the key to

tackle the global unemployment problem. This necessitated a partnership between non - governmental organizations and the corporate sector. In the midst of this scenario BYST was approached by DIAGEO[5], a multinational, to launch a youth entrepreneurship development programme in Pune (Western India) in 1994. CII, which was already a support partner to BYST in Delhi and Chennai, came forward to provide the infrastructure and managerial support in Pune as well.

[5] DIAGEO is a global company, trading in over 180 markets around the world.

ANNEXURE

CONTENT

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Annex I. AUTO POLICY OF GOVERNMENT OF INDIA

Vision
TO ESTABLISH A GLOBALLY COMPETITIVE AUTOMOTIVE INDUSTRY IN INDIA AND TO DOUBLE ITS CONTRIBUTION TO THE ECONOMY BY 2010

Policy Objectives
This policy aims to promote integrated, phased, enduring and self-sustained growth of the Indian automotive industry. Some of the salient objectives are to:

- Establish an international hub for manufacturing small, affordable passenger cars and a key center for manufacturing Tractors and Two-wheelers in the world;
- Ensure a balanced transition to open trade at a minimal risk to the Indian economy and local industry;
- Conduce incessant modernization of the industry and facilitate indigenous design, research and development;
- Steer India's software industry into automotive technology;
- Assist development of vehicles propelled by alternate energy sources
- Development of domestic safety and environmental standards at par with international standards

Foreign Direct Investment
Automatic approval for foreign equity investment up to 100% of manufacture of automobiles and component is permitted.

Incentive for Research and Development
The Government shall promote Research & Development in automotive industry by strengthening the efforts of industry in this direction by providing suitable fiscal and financial incentives.

Environmental Aspects
1. The automotive and oil industry have to heave together to constantly fulfill environment imperatives. The Government will continue to promote the use of low emission fuel auto technology.

2 The Government after considering the recommendations of the Expert Committee on Auto Fuel Policy headed by Dr. R.A. Mashelkar has approved a road map for implementation for the auto fuel quality consistent with the required levels of vehicular emissions norms and environmental quality. The Government will formulate a comprehensive auto fuel policy covering the other related aspects and ensure availability of appropriate auto fuel/fuel mixes at minimum social costs across the country. Suitable institutional mechanism will be put in place for certification, monitoring and enforcement of different technologies/fuel mixes. Appropriate fiscal measures will be devised to achieve milestones in the roadmap for implementation of auto fuel policy.

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3 In the short run, the Government will encourage the use of short chain hydrocarbons along with other auto fuels of the quality necessary to meet the vehicular emissions norms.

4 There is prime need to support the development and introduction of vehicles propelled by energy sources other than hydrocarbons by promoting appropriate automotive technology. Hybrid vehicles and vehicles operating with batteries and fuel cells are alternatives to the conventional automobile, which in their early beginnings, lie in treasured. As an impetus for the development of such vehicles, an appropriate long-term fiscal structure shall be put in place to facilitate their acceptance vis-à-vis vehicles based on conventional fuels.

Safety
Government will duly amend the Central Motor Vehicles Rules, Bureau of Indian Standards (BIS) and other relevant provisions and introduce safety regulations that conform to global standards.

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Annex II: INDUSTRIAL POLICY OF MAHARASHTRA 2001

(Source: Ministry of Small Scale Industries, Government of India)

The economic reforms initiated in the country in 1991 brought about a paradigm shift in the approach to economic growth, industrialization and income distribution. A number of control regimes were dismantled in the areas of industrial policy, taxation, export-imports and foreign investment. De-licensing of industry, de-reservation of the public sector, easing of competition controls, reduction of import tariffs, deregulation of interest rates, and opening up of capital markets were among the reforms undertaken to encourage investment and capital formation.

The Industrial Policy of Maharashtra 1993 mainly aimed at simplification of procedures and rationalization of rules and the **Industry, Trade & Commerce Policy 1995** aimed at empowering people at all levels with special focus on infrastructure development with private sector participation. A comprehensive **Information Technology Policy** was announced in 1998, keeping in view the importance of the financial sector, media and entertainment, and health, education and research.

Strategies:

The State has entered into the phase of second-generation economic reforms, with emphasis on structural changes in addition to fiscal incentives for the promotion of industry and balanced regional growth. This has coincided with increasing international competition and rapid technological changes, which pose new challenges for industry. The Industrial Policy 2001 has been formulated in this context, keeping in view the objectives of sustained growth and employment and an expansion in livelihood opportunities. It supplements the provisions of the Information Technology and other sectoral policies announced earlier. The components of the new Package Scheme of Incentives contained in this Policy will be operative from 1st April 2001 up to 31st March 2006:

New industries establishing in C, D, and D+ areas and No-Industry District(s) will be exempted from payment of Electricity Duty for a period of 15 years. In other parts of the State, 100% Export Oriented Units (EOUs), Information Technology (IT) and Bio-Technology (BT) units, and industries setting up in Special Economic Zones (SEZs), and Electronic Hardware Technology Parks will be exempted from payment of Electricity Duty for a period of 10 years.

New Industrial Townships: Maharashtra pioneered the establishment or institutions of democratic decentralizations and local self-governance several decades ago. More recently, these concepts were extended through statutory amendments to enable the establishment of independent Industrial Townships. In the first phase, self-governing Industrial Townships with the power to raise resources and determine their application will be established in industrial areas being developed by MIDC at twelve locations across the State, i.e. at Vile-Bhagad (Raigad), Airoli (Thane), Talegaon (Pune), Hinjewadi - Man (Pune), Shendre (Aurangabad), Additional Latur (Latur), Nandgaon Peth (Amravati), Additional Yavatmal (Yavatmal), Tadali (Chandrapur), Butibori (nagpur), Additional Sinnar (Nashik) and Nardhana (Dhule). The industrial townships so set up will pay 25% of their revenue to the concerned Gram Panchayat(s) or local bodies for the initial period of 5 years.

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Promotion of Education and Research Institutions: Educational and research institutions of international or national standards, including world-class business education institutions, would be provided land in industrial areas/estates at nominal or concessional rates.

Annex III: EMISSION STANDARDS

(Source: SIAM)

Introduction

The automobile industry has to address the following issues at all the stages of vehicle manufacture:

- Environmental Imperatives
- Safety Requirements
- Competitive Pressures and
- Customer Expectations

There is a strong interlinking amongst all these forces of change, influencing the automobile industry. These have to be addressed consistently and strategically to ensure competitiveness.
Since pollution is caused by various sources, it requires an integrated, multidisciplinary approach. The different sources of pollution have to be addressed simultaneously in order to stall widespread damage.

The Parameters Determining Emission from Vehicles

- Vehicular Technology
- Fuel Quality
- Inspection & Maintenance of In-Use Vehicles
- Road and Traffic Management

While each one of the four factors mentioned above have direct environmental implications, the vehicle and fuel systems have to be addressed as a whole and jointly optimized in order to achieve significant reduction in emission.

Vehicular Technology

In India, the vehicle population is growing at rate of over 5% per annum and today the vehicle population is approximately 40 million. The vehicle mix is also unique to India in that there is a very high proportion of two wheelers (76%).

History of Emission Norms in India

The significant environmental implications of vehicles cannot be denied. The need to reduce vehicular pollution has led to emission control through regulations in conjunction with increasingly environment-friendly technologies.
It was only in 1991 that the first stage emission norms came into force for petrol vehicles and in 1992 for diesel vehicles.

From April 1995 mandatory fitment of catalytic converters in new petrol passenger cars sold in the four metros of Delhi, Calcutta, Mumbai and Chennai along with supply of Unleaded Petrol (ULP) was affected. Availability of ULP was further extended to 42 major cities and now it is available throughout the country.

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The emission reduction achieved from pre-89 levels is over 85% for petrol driven and 61% for diesel vehicles from 1991 levels.

In the year 2000 passenger cars and commercial vehicles will be meeting Euro I equivalent India 2000 norms, while two wheelers will be meeting one of the tightest emission norms in the world.

Euro II equivalent Bharat Stage II norms are in force from 2001 in 4 metros of Delhi, Mumbai, Chennai and Kolkata.

Since India embarked on a formal emission control regime only in 1991, there is a gap in comparison with technologies available in the USA or Europe. Currently, we are behind Euro norms by few years, however, a beginning has been made, and emission norms are being aligned with Euro standards and vehicular technology is being accordingly upgraded. Vehicle manufactures are also working towards bridging the gap between Euro standards and Indian emission norms.

Fuel Technology

In India we are yet to address the vehicle and fuel system as a whole. It was in 1996 that the Ministry of Environment and Forests formally notified fuel specifications. Maximum limits for critical ingredients like Benzene level in petrol have been specified only recently and a limit of 5% m/m and 3% m/m has been set for petrol in the country and metros respectively.

In place of phase-wise upgradation of fuel specifications there appears to be a region-wise introduction of fuels of particular specifications. The high levels of pollution have necessitated eliminating leaded petrol, through out the country.

To address the high pollution in 4 metro cities 0.05% sulphur petrol & diesel has been introduced since 2000-2001. The benzene content has been further reduced to 1% in Delhi and Mumbai.

There is a need for a holistic approach so that upgradation in engine technology can be optimized for maximum environmental benefits.

Annex IV: MILESTONES – BAJAJ AUTO

2004 - September
Bajaj Discover DTS-i launched
New Bajaj Chetak 4 stroke with Wonder Gear launched
Bajaj CT100 Launched
Bajaj unveils new brand identity, dons new symbol, logo and brand line

2003: Pulsar DTS-i is launched.
107,115 Motorcycles sold in a month.
Bajaj Wind 125,The World Bike, is launched in India.
Bajaj Auto launched its Caliber115 "Hoodibabaa!" in the executive motorcycle segment.
Bajaj Auto launches its latest offering in the premium bike segment 'Pulsar'.
The Eliminator is launched.

1999: Caliber motorcycle notches up 100,000 sales in record time of 12 months.
Production commences at Chakan plant.

1998: Kawasaki Bajaj Caliber rolls out of Waluj.
Legend, India's first four-stroke scooter rolls out of Akurdi.
Spirit launched.

1997: The Kawasaki Bajaj Boxer and the RE diesel Autorickshaw are introduced.

1995: Bajaj Auto is 50.
Agreements signed with Kubota of Japan for the development of diesel engines for three-wheelers and with Tokyo R&D for ungeared Scooter and moped development.
The Bajaj Super Excel is introduced while Bajaj celebrates its ten millionth vehicle.
One million vehicles were produced and sold in this financial year.

1986: The Bajaj M-80 and the Kawasaki Bajaj KB100 motorcycles are introduced.
500,000 vehicles produced and sold in a single financial year.

1977: The Rear Engine Autorickshaw is introduced.
Bajaj Auto achieves production and sales of 100,000 vehicles in a single financial year.

1972: The Bajaj Chetak is introduced.

1970: Bajaj Auto rolls out its 100,000th vehicle.

1959: Bajaj Auto obtains license from the Government of India to manufacture two- and three-wheelers.

1945: Bajaj Auto comes into existence as M/s Bachraj Trading Corporation Private Limited.

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Annex V: MILESTONES – TATA MOTORS

It has been a long and accelerated journey for Tata Motors, India's leading automobile manufacturer. Some significant milestones in the company's journey towards excellence and leadership.

1945: Tata Engineering and Locomotive Co. Ltd. was established to manufacture locomotives and other engineering products.

1948: Steam road roller introduced in collaboration with Marshall Sons (UK).

1954: Collaboration with Daimler Benz AG, West Germany, for manufacture of medium commercial vehicles. The first vehicle rolled out within 6 months of the contract.

1959: Research and Development Centre set up at Jamshedpur.

1961: Exports begin with the first truck being shipped to Ceylon, now Sri Lanka.

1966: Setting up of the Engineering Research Centre at Pune to provide impetus to automobile Research and Development.

1971: Introduction of DI engines.

1977: First commercial vehicle manufactured in Pune.

1983: Manufacture of Heavy Commercial Vehicle commences.

1985: First hydraulic excavator produced with Hitachi collaboration.

1986: Production of first light commercial vehicle, Tata 407, indigenously designed, followed by Tata 608.

1989: Introduction of the Tatamobile 206 - 3rd LCV model.

1991:

- Launch of the 1st indigenous passenger car Tata Sierra.
- TAC 20 crane produced.
- One-millionth vehicle rolled out.

1992: Launch of the Tata Estate.

1993: Joint venture agreement signed with Cummins Engine Co. Inc. for the manufacture of high horsepower and emission friendly diesel engines.

1994:

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- Launch of Tata Sumo - the multi utility vehicle.
- Launch of LPT 709 - a full forward control, light commercial vehicle.
- Joint venture agreement signed with M/s Daimler - Benz / Mercedes - Benz for manufacture of Mercedes Benz passenger cars in India.
- Joint venture agreement signed with Tata Holset Ltd., UK for manufacturing turbochargers to be used on Cummins engines.

1995: Mercedes Benz car E220 launched.

1996: Tata Sumo deluxe launched.

1997:

- Tata Sierra Turbo launched.
- 100,000th Tata Sumo rolled out.

1998:

- Tata Safari - India's first sports utility vehicle launched.
- 2 millionth vehicle rolled out.
- Indica, India's first fully indigenous passenger car launched.

1999:

- 115,000 bookings for Indica registered against full payment within a week.
- Commercial production of Indica commences in full swing.

2000:

- First consignment of 160 Indicas shipped to Malta.
- Indica with Bharat Stage 2 (Euro II) compliant diesel engine launched.
- Utility vehicles with Bharat 2 (Euro II) compliant engine launched.
- Indica 2000 (Euro II) with multi point fuel injection petrol engine launched.
- Launch of CNG buses.
- Launch of 1109 vehicle - Intermediate commercial vehicle.

2001:

- Indica V2 launched - 2nd generation Indica.
- 100,000th Indica wheeled out.
- Launch of CNG Indica.
- Launch of the Tata Safari EX
- Indica V2 becomes India's number one car in its segment.
- Exits joint venture with Daimler Chrysler.

2002:

- Unveiling of the Tata Sedan at Auto Expo 2002.
- Petrol version of Indica V2 launched.
- Launch of the EX series in Commercial vehicles.
- Launch of the Tata 207 DI.

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- 2,00,000th Indica rolled out.
- 5,00,000th passenger vehicle rolled out.
- Launch of the Tata Sumo'+' Series
- Launch of the Tata Indigo.
- Tata Engineering signed a product agreement with MG Rover of the UK.

2003:

- Launch of the Tata Safari Limited Edition.
- The Tata Indigo Station Wagon unveiled at the Geneva Motor Show.
- On 29th July, J. R. D. Tata's birth anniversary, Tata Engineering becomes Tata Motors Limited.
- 3 millionth vehicle produced.
- First CityRover rolled out
- 135 PS Tata Safari EXi Petrol launched
- Tata SFC 407 EX Turbo launched

2004:

- Tata Motors unveils new product range at Auto Expo '04.
- New Tata Indica V2 launched
- Tata Motors and Daewoo Commercial Vehicle Co. Ltd. sign investment agreement
- Indigo Advent unveiled at Geneva Motor Show
- Tata Motors completes acquisition of Daewoo Commercial Vehicle Company
- Tata LPT 909 EX launched
- Tata Daewoo Commercial Vehicle Co. Ltd. (TDCV) launches the heavy duty truck 'NOVUS', in Korea
- Sumo Victa launched
- Indigo Marina launched
- Tata Motors lists on the NYSE

2005:

- Tata Motors rolls out its 500,000 th Passenger Vehicle
- The Tata Xover unveiled at the 75th Geneva Motor Show
- Branded buses and coaches - Starbus and Globus - launched
- Tata Motors acquires 21 % stake in Hispano Carrocera SA, Spanish bus manufacturing Company
- Tata Ace, India's first mini truck launched

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Annex VI: LIST OF PUNE BASED AUTO COMPONENT MANUFACTURERS WHICH ARE MEMBERS OF ACMA (Source: www.acmainfo.com)

Company	Products
Ashra Consultants Pvt. Ltd.	Air, Lube Oil, Fuel Filters, Air Oil, Fuel Water Separators, Separation and Filtration Solutionsfilters and separators, upto 2000 cfm, suction filters, air filters, air oil separators, air cleaner assemblies.
AUTO ELECTRONICS	Manufacturer Of Electronics Items For Two,Three & Four Wheelers
Autofield Engineers Private Limited	IC ENGINE VALVE Inlet & Exhaust valves for internal combustion Engines of all types
Automotive Stampings & Assemblies Limited	Sheet Metal Components, Assemblies, Modules & Aggregates.
Bharat Forge Ltd.	Steel forgings and finish machined components AUTOMOTIVE: Crankshafts, Front axle beams & Steering knuckles (forged & machined); Connecting Rods, Camshafts & Rocker Arms (Forged). NON AUTOMOTIVE: Forged & Machined components for oilfield industry; Forged & Machined components (Open die forgings) for sugar, cement, steel, mining, power, chemical, forging, fertilizer, shipbuilding industries & general engineering equipment
Caltherm Thermostats Pvt Ltd.	Automotive & Heavy Duty Thermostats
Chaphekar Engineering Pvt. Ltd.	Hand Brake Assy., Bonnet Lock, Steering Column,Radiator Frames Strainer ,Brackets,LCV & MCV LOAD BODIES.
Dali & Samir Engineering Pvt. Ltd.	Fuel tanks , Exhaust Systems,auto components
DGP Hinoday Industries Ltd.	Ceramic Arc Segment magnets, Ceramic ring magnets,Ferrite core magnets, Colour deflection yoke core magnets, S.G. Iron Automotive castings
Dyna-K Automotive Stampings Pvt. Ltd.	Sheet Metal Press Parts for Automtove Application
Enginetech Systems Pvt. Ltd.	REAR VIEW MIRROR, AIR FILTER, AUXILARY WATER TANK, BRAKE OIL TANK, SERVICE INDICATOR, WATER SEPARATOR REAR VIEW MIRRORS BRAKE OIL TANK SERVICE INDICATOR FUEL WATER SEPARATOR SAFETY SEAT BELTS AIR FILTER
G.B. Rubber Products	RUBBER TO METAL BONDED "Engine Mountins, Isolator, Buffers, Dampers, Tentioner Cam Chain, Guide Cam Chain, LInk Bushes OTHER THAN METAL BONDED Viton MultiLip Seal, O Rings, Bellows, W/C Boot for brake system, components in shoke absorber & struts, component for vaccum brake, CV Boots
GKN Sinter Metals Ltd	Sintered Bearings & Parts, Sintered Automotive Components, Filters & Metal Powders
Indo Schottle Auto Parts Pvt. Ltd.	1. Engine Valve Collets 2. Rocker Arm Screws 3. Turbocharger components viz.Oil Seal Plates, Journal Bearings and Wastegate Bushings 4. Other precision parts viz.Fuel System Parts, Gear Pump Bushings
Jaya Hind Industries Ltd.	Die cast components, Auto electrical, Magnetos, AC Generators and Ignition coils
Kailash Vahan Udyog Ltd.	Sheet Metal Components, Load Bodies – LCV, MCV, Trailors, Tippers Buses.
Kalyani Brakes Ltd.	Air & Hydraulic Brake systems Hydraulic, Air & Air over hydraulic brake components
Kemen Springs Pvt. Ltd.	All types of springs within a range of wire dia 0.2mm to 5.0mm
Kirloskar Oil Engines Ltd.	Bearing,Bushes,T/washers Thin walled engine bearings, Bushes, Thrust washers and engine valves

Mahle Filter Systems (India) Pvt.Ltd	AIR,OIL,FUEL,CANISTER FILTERS
Metlon Engineers Pvt Ltd.	Sheet metal pressed and fabricated components for Automobile industries
Minda Stoneridge Instruments Ltd.	Instrument cluster, Speedometer, Tank unit/Guages etc
Motherson Sumi Systems Ltd	wiring harness
Panse Autocomps Pvt. Ltd.	Sheet metal pressings, Assemblies and Aggregates
Patodia Glass Industries Ltd	Automobile Bulbs
Pefco Foundry (A Div. of Kores (India) Ltd.)	Ductile Iron Castings, Valve Seat Inserts, Tappet Valves, Centrifugally Cast Cylinder Liners.
Polybond India Pvt. Ltd.	High performance moulded rubber parts, Rubber-to-Metal bonded parts, Rubber Hoses
Poona Shims Pvt. Ltd.	OIL COOLERS
Rinder India Pvt Ltd	Automotive Lightings & Signaling Equipments. Head lamps, Tail lamps, Indicators, Reflex reflector
Rojee-Tasha Stampings Pvt. Ltd.	Heavy Sheet Metal Stampings Automotive pressings
RSB Transmissions (I) Ltd.	Manufacturing Fully finished automotive Gears, Propeller Shaft Components, Machined components such as exhaust manifold, Housing etc.
S M Auto Engineering Pvt. Ltd.	RADIATOR EXHAUST SYSTEM AIR FILTER FUEL TANK SILENCER
Saint-Gobain Sekurit India Ltd.	Tempered & Laminated Automotive Safety Glass
Shutham Electric Ltd.	Steering column mounted combination switch, Window lift switch, Facia switch, Mirror adjustment switch, Transfer case selection switch, Hazard warning switch, Glove box switch, Door ajar switch, Battery isolator switch, Reverse light & Low pressure switch
Siemens VDO Automotive Ltd.	Auto components e.g. wiring harness
Spaco Carburettors (India) Ltd	Carburettors for 2 & 3 Wheelers (auto components)
Syndicate Exhaust Systems (P) Ltd.	Silencer Exhaust System
Tata Auto Plastic Systems Ltd	Automotive Interiors & Exteriors
Tata Ficosa Automotive Systems Ltd.	Rear view mirrors, Command & Control cables, Parking brake lever, Gear shifter and Windshield washer system
Tata Johnson Controls Automotive Ltd	Seating System
Tata Toyo Radiator Ltd.	Aluminium Brazed Heat Exchangers
Tata Yazaki Autocomp Ltd.	WIRING HARNESS FOR AUTOMOTIVES
Tyco Electronics India	Design, Development and Manufacturing of Cable Assembly/Harnessing For Domestic Appliances For Exports 1. Designed & Developed end-to-end harnessing system for Indica - the first indigenously developed small car in India 2. Cable assys for antilock Braking System & Air bag 3. End-to-end harnessing system for Sumo (Multi utility vehicle) 4. End-to-end harnessing system for Mobile (Multi utility vehicle) 5. End-to-end harnessing system for Magna (Luxury car Under Development) We export to countries world wide : USA France Germany Japan Great Britain Holland Singapore
Western Pressing Pvt Ltd.	MANUFACTURERS OF EXHAUST SYSTEMS FOR AUTOMOBIL
ZF Steering Gear (India) Ltd.	Integral Hydraulic Power Steering Gears and Mechanical Steering gears for Automotive Applications

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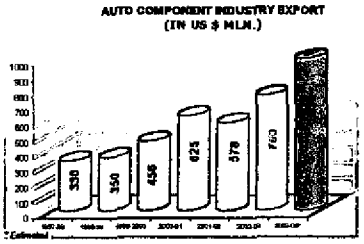
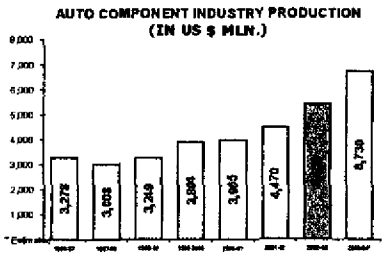
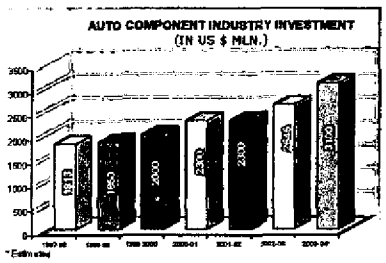
Annex VII: AUTO COMPONENT INDUSTRY PERFORMANCE IN INDIA AS A WHOLE (IN US $ MIL)







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