

Preface

The Summit on Infrastructure, Housing and Real estate is the first in series of the programmes to be organized by the IPCSI (International Punjabi Chamber for Service Industry) under the aegis of the Punjab Government, Department of NRI Affairs. Infrastructure is the sine qua non of all economic development, whether it is manufacturing, agriculture or even the service sector. And it is from the level of Infrastructure development, a country has achieved that we can form a fairly good idea of its overall economic development.

The objective in organizing this Summit is to consider the broad spectrum of the infrastructure, its existing status and what needs to be achieved in this regard in future in its various segments. These segments include not only roads, railways, ports, power and telecommunications, but also water supply, solid waste management systems, housing & real estate and many more. Another objective is to bring NRI investors, entrepreneurs, developers, realtors, businessmen, Indian corporate, policy makers and planners on a common platform to deliberate on tapping the vast potential Punjab has for creating quality infrastructure. This will also go a long way in generating employment opportunities and entrepreneurship for our youth.

We sincerely hope that the present Summit would prove to be a catalyst in bringing more investments to Punjab, which is already at the threshold of taking a quantum jump in developing its overall economy and ensuring progress and prosperity for the people.

There are many reasons for investment in infrastructure- related projects and in developing housing colonies and in real estate ventures. In a survey of “India’s Best & Worst States” by a leading news magazine in India, Punjab was ranked the NO.1 Investment Destination amongst all large states in India. Amongst other accolades, Punjab has also been ranked the Best State in India to live & Work, ranked first for Infrastructure Index, first for Agriculture Production, first for attractive Consumer Market and also first for Budget and Prosperity amongst all other Indian States. With these high points, it is hoped that our distinguished guests would further be motivated to consider Punjab as their first preference for future investment

The basic thrust of our approach has been how we could link up the Indian Diaspora, who is playing a significant role particularly of Punjabi origin for giving a further push to the developmental processes in Punjab. There is a huge reservoir of resources, talent and goodwill in the Diaspora, which could be tapped, provided we meet their aspirations of transparency in administration, provide good infrastructure and create investor – friendly environment.

In the Backgrounder we have tried to give an overview of the infrastructure scenario and the opportunities that are available in the housing and real estate and their potential for the State of Punjab.

We sanguinely hope that the Summit would help us in bringing a larger amount of resources in giving a push to the laudable efforts of the State Government in developing quality infrastructure and in networking of the Punjabi Diaspora with Indian corporate and others who are genuinely devoted to the development of Punjab.

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It is hoped that our distinguished participants in the Summit would find the Backgrounder a useful publication. Being conscious of the fact, that there is much scope for improving the text, we would whole heartedly welcome their views and comments which would, indeed, are very useful to us for its second print. www.ipcsi.org

My sincere thanks are due to Ms Shilpa Bhaskar, our senior colleague at the ITFT, who has worked tirelessly for researching and compiling all the chapters included in this Backgrounder. I would also like to thank our Creative Head, Mr Sumant Vadhera for all creative inputs as also Anupam Bhaskar, Usha Sondhi and Prof. Narinder Kumar for their work and diligence in its production.

4th March, 2006

Maj (Dr) Gulshan Sharma, Retd.
Secretary General IPCSI

Chapter -1

Overview

The Strategic Infrastructure Plan for Punjab is about meeting Punjab's future needs. Infrastructure is everywhere in the daily lives of Punjab's citizens. It is the state's roads and rail, the hospitals, schools and sports fields, the airports and parks, the water and waste management systems. It enables the state's economic and social systems to work well.

Infrastructure is expensive to build, operate and maintain. But it is long-lived and delivers benefits across generations. Today's Punjab citizens are reaping the benefits of infrastructure investments provided by their parents and grandparents.

Vision-2020 outlines what Punjab now needs to do to build new infrastructure, overhaul and update existing infrastructure and avoid bottlenecks so that the state is left in good order for future generations. This is a plan to take Punjab through the coming decade and beyond. It covers all aspects of the state's infrastructure – physical built assets, delivery of infrastructure for social services and natural heritage. The plan sets both broad and specific priorities and marks the government's resolve to meet them, but it is not chiseled in stone. It is rather a living, unfolding plan that will grow and change over time to meet new challenges and take up new opportunities.

Punjab must invest in its infrastructure. That investment must come from the public and private sectors. There is no time to waste. This plan sets out the state's infrastructure priorities.

A massive Rs.600 billion (\$13 billion) worth of investment in Punjab's infrastructure could soon transform cities and change the image of the agrarian state to that of a commercial hub. The investment would be seen in mega malls, multiplexes, new cities, residential colonies, tolled highways, hotels, shopping complexes and other infrastructure projects like IT parks in leading cities across Punjab. Sources in the real estate market and Punjab officials confirmed that the entire investment of Rs.600 billion would be made in the next three years, and more investment was likely to come. Major beneficiaries of the investment would be cities like Ludhiana, Jalandhar, Amritsar, Mohali (adjoining state capital Chandigarh), Patiala, Bathinda and Hoshiarpur. Construction activity is in full swing in a number of projects and bookings for space are being made. A private builder in Ludhiana has claimed that the shopping mall-cum-multiplex being built in the city had one of the biggest floor spaces in the country. This complex would have eight theatres for screening movies. Punjab does not have even a single multiplex at present. The region's first multiplex - Fun Republic at state capital Chandigarh, which is a union territory - opened just two years ago. Besides leading cities, the highways running through the state are of special interest to investors given the spending power of Punjabis, especially non-resident Indians (NRIs). A number of multiplexes, hotels and shopping mall projects have been approved by the government along highways - particularly the National highway No. 1 (old Grand Trunk Road) between Ambala and Amritsar as well as other highways linking Chandigarh with leading cities. The Amarinder Singh government has accorded approval to multiplexes, shopping malls and hotels - worth over Rs.3.05 billion - on the busy Chandigarh-Zirakpur-Shimla road and in Ludhiana, Jalandhar and Mohali. All these projects are to be executed by private builders. The approval to the projects was part of a Rs.77 billion investment granted by the state government for industrial projects. These include a Rs.9 billion home textile project by the private Abhishek Industries and another private-sector steel manufacturing unit worth Rs.2.1 billion. A real estate investor, Everest Buildwell Ltd, has

proposed to set up six multiplex-cum-shopping mall projects in and around Amritsar, Jalandhar, Patiala, Bathinda and Mohali with a minimum investment of Rs.1 billion on each within three years. In November, the government signed a memorandum of understanding with a Dubai government agency, Emaar Properties, and its Indian partner MGF Constructions for building four new townships worth Rs.40 billion. The townships, to be set up around Ludhiana, Mohali, Amritsar and Jalandhar, would be an integrated project with all facilities. "Real estate is already on a high these days with property prices soaring. The kind of infrastructure coming up in Punjab now will change the state completely. We are looking at domestic and NRI buyers both," said Ludhiana-based real estate consultant Amarjit Singh. NRI investment in real estate in Punjab has increased manifold in recent years, property experts said. "The dark days of terrorism (1981-93) are over and it seems as if people are out to make up for lost time. Investment is coming into Punjab in a big way," said Britain-based NRI Harjit Singh, who recently invested in Jalandhar city. The government has already approved another five projects - worth Rs.44 billion - for residential townships around Jalandhar, Ropar and Bathinda. The investors include DLF Universal (Rs.30 billion), PACL-India (Rs.2 billion), Ansal-Mital township projects (Rs.2.05 billion), Taneja Developers (Rs.2.66 billion) and Ansal townships and projects limited (Rs.7.5 billion). In recent months, over 100 projects have been sanctioned by the government worth over Rs.350 billion. These include three industrial and IT park projects at Mohali and Ludhiana worth Rs.6.57 billion. "Punjab has recaptured its No.1 position from the 14th among states in terms of growth and infrastructure development. IT is being preferred for investment. Our industrial growth has doubled and exports are up by 2.5 times in the last three years. The government has sanctioned five road projects worth Rs.3.03 billion on build-operate-transfer (BOT) basis. Industrialist Mukesh Ambani has shown interest in setting up eight agro-processing units in Punjab with an investment of Rs.50 billion. Ambani's concept is to supply fresh vegetables and fruits from Punjab to the Middle East and Europe. The Bharti Group (Airtel) is also setting up a cold chain unit at Ladowal near Ludhiana in collaboration with Britain-based Rothschild to export fresh fruits and vegetables to Central Asia, Europe and the Middle East.

Build till land's end seems to be the motto guiding real estate development in one of the most rich states of the country -- Punjab. And guess who is driving this reality drive -- the non-resident Indian (NRI) community. The empowered committee of the Punjab government, which is headed by the chief minister, has given clearance for big residential-cum-commercial projects to Unitech, ATS infrastructure, Taneja Developers and Infrastructure Ltd, Ansal Buildwell, Parsavnath Builders, Uppal Group and EMMAR-MGF. During the last six months, more than 100 real estate projects -- both in residential and commercial segments -- have been launched in Punjab. The NRI community is showing great interest back home, which is another reason for this growth. The contemporary British styling is complemented by a heightened sense of spaciousness and refinement. The designing and interiors are understated and flow outwards into the serene landscaped greens, while a slew of ultra-modern amenities, including hidden air-conditioning in every room, make for a luxurious living experience. The region has a very large NRI population which, despite having their hometown elsewhere, wants to purchase a second house near Chandigarh. This is where Mohali comes into the picture. The fact that Chandigarh is the capital of two states also adds allure. People who have worked all their lives here would like to settle here after retirement. In fact, another reason for this spurt is that over 50% of the NRIs in the US, Canada, Dubai and London are seek housing loans, which are now available on easy terms. They go for residential flats worth Rs 50 lakh to Rs 3 crore

bungalows. After a successful offtake last year of properties in the crore-plus bracket, several developers in Punjab have taken it as an encouraging sign to plan pricier projects. Besides, this is a good time for investment in such projects as there has been a 25-30% price rise mainly due to higher construction costs. The changing market dynamics are also driving developers to take their inspiration from the skylines of the highrise condominiums in advanced economies and offer the NRIs matching quality

Chapter-2

INFRASTRUCTURE OPPORTUNITIES: INDIAN OVERVIEW

Infrastructure sector growing at 15 per cent p.a.

Infrastructure development in India has set off in a major way in the past few years and is witnessing impressive growth across various segments. A recent study indicates that India would be merely scratching the surface of the potential infrastructure opportunity with USD 191.51 billion of investments committed over the next five years. The sector is estimated to grow at a CAGR (Compound Annual Growth Rate) of 15 per cent over the next few years.

Construction sector to be the biggest beneficiary of the infrastructure boom

In India, construction is the second largest economic activity after agriculture. The investment in construction accounts for nearly 11 per cent of India's Gross Domestic Product (GDP) and nearly 50 per cent of its Gross Fixed Capital Formation (GFCF). It accounts for nearly 65 per cent of the total investment in infrastructure and is expected to be the biggest beneficiary of the surge in infrastructure investment over the next five years. The investment in this segment over the financial year 2005 to 2010 is estimated at USD 124.65 billion. The growth in the infrastructure sector is being driven by a host of factors.

Key drivers underlying the growth

Political will: The Government of India (GOI) has initiated an ambitious reform programme, involving a shift from a controlled to an open market economy. The Government is also undertaking several measures to enhance the quantum of investments in the infrastructure segment.

Funding from multi-lateral agencies: Multilateral agencies such as the World Bank and the Asian Development Bank (ADB) are funding various infrastructure projects on a large scale in India. Other agencies include the Japan International Bank for Cooperation (JIBC) that funded the Delhi Metro (Underground Railway) Project. Various State Governments are also mobilizing funds from these agencies to support rural roads and sanitation projects.

Increased private participation: To encourage private sector participation in the sector, the Government has announced several tax breaks for investments. It is also devising return schemes that are attractive for the private participants, such as annuity payments and capital grants for road projects. Laws are being enacted to improve the finances of utilities and make their management more transparent, so as to improve returns on these facilities.

Innovative modes of funding: The Government is tapping alternative sources of funds for infrastructure development. One of these is the cess on petrol and diesel, which is being used to fund road projects such as the Golden Quadrilateral and the North- South East-West corridor. It is also contemplating levying a tonnage tax on ships (to fund development of ports), and special taxes on air travel (for airports).

Airports, Power, Roads, and Realty- Investments surging

In terms of investments- roads, power and airports are expected to see rapid growth in the near future as the initial foundations for private investments have already been laid in these sectors. Further, the increased demand in housing and commercial space as a result of improved standards of living and economic growth, is expected to result in rampant growth in the realty sector.

THE real estate market in India is on a high growth curve, on the back of a booming economy, favourable demographics and liberalised FDI regime, although issues such as lack of land reforms, and absence of substantial tax incentive for real estate development still need to be addressed.

"In India's fast-growing economy, real estate has emerged as one of the most appealing investment areas for domestic as well as foreign investors. The real estate sector will continue to derive its growth from the booming IT sector, since an estimated 70 per cent of the new construction is for the IT sector," a report by PricewaterhouseCoopers has said.

The report, which has a chapter dedicated to the Indian market, further said that besides the demand from the IT sector, the basic need for modern real estate would provide lucrative opportunities for investment.

"Low interest rates, modern attitudes to home ownership (the average age of a new homeowner is now 32 years compared with 45 years a decade ago), economic prosperity along with a change of attitude amongst the young working population from that of 'save and buy' to 'buy and repay' and liberalised FDI regime have all contributed to this boom," it said.

Listing out the challenges for the real estate market in India, the report said that Indian Government's tax policy was not in tandem with the liberalisation initiatives being undertaken in the sector.

"There are no substantial tax incentives for real estate development except in the limited circumstances. Even in these situations, the tax incentive windows have a short life left. The prevailing tenancy laws in India are not in favour of owners of the land," it said.

"Once the Government puts into place land reforms and addresses the challenges facing the real estate sector, this sector has the potential to contribute immensely to the country's GDP," it said. The report said that although Government has not undertaken capital market level deregulation measures, such as allowing REITs (whether domestic or foreign owned) to operate in India, in 2004 it had allowed international and domestic companies to operate real estate funds/pooled vehicles through the private equity fund route. The move combined with the boom in the real estate market opened the doors for a host of realty funds. "While most funds were initially floated by financial Institutions or banks such as HDFC, ICICI Bank and Kotak Mahindra Bank, real estate developers like DLF Universal and even retailers such as Pantaloon have now entered the arena for creating more retail facilities. Most of the funds floated in the recent past have received a strong response from investors. Reports suggest that over the past six months, about \$500 million has already flowed into the real estate sector," it said, adding that the flow may rise to a massive \$7-8 billion over the next 18-30 months.

Key Opportunities

Roads Roads occupy an eminent position in India's transportation as they carry nearly 70 per cent of freight and 85 per cent of passenger traffic in the country. Presently, India's road network spans a distance of around 3.3 million km.

India's Road Infrastructure as on May, 2005.

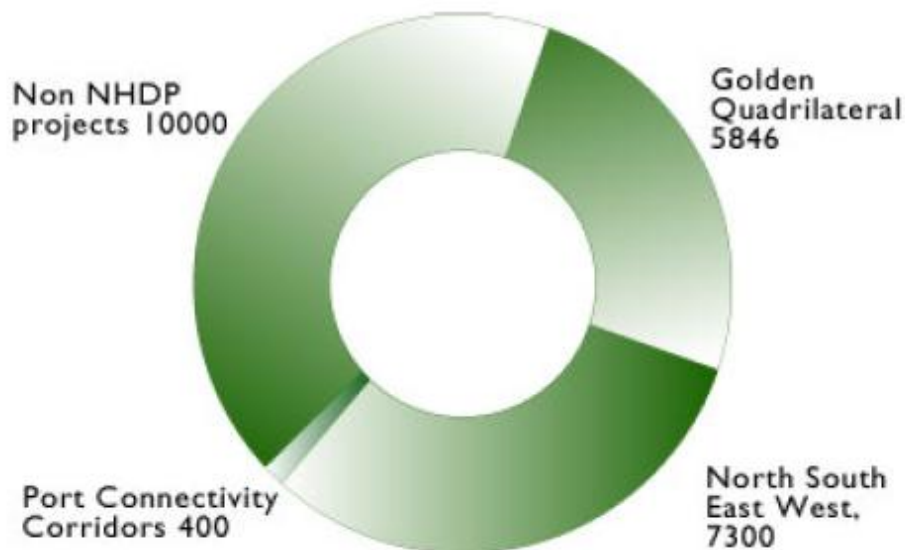
Types of Road	Length (km)	Percentage of Total
National Highways	65,569	2.0
State Highways	131,899	4.0
Major District Roads	467,763	14.1
Village and Other Roads	2,650,000	79.9
Total	3,315,231	100

(Source: National Highway Development Authority)

1. Government investments would provide the impetus for growth

The focus of successive Governments on improving road connectivity across the country has brought about significant investments in road development. Government expenditure on roads in India is significant - 12 per cent of capital and 3 per cent of total expenditure; however, road maintenance is grossly under-funded with only one third of needs being met. Recognizing the present deficiencies in the road network, the Government of India has sought to address these through the Tenth National Plan (2002-2007), which has assigned a high priority to the National Highway Development Programme (NHDP). As per the National Highways Authority of India (NHAI), a total of 23,546 kms of roads would be constructed in 2006-2007.

Road Projects Under Execution (In kms)



Source: NHDA

2. Private sector participation in road development

Some of the key players in this segment and recent projects completed by these companies are provided in the table below.

Company	Projects Completed
L&T	<ul style="list-style-type: none">• Four-laning of Ahemdabad-Mehsana Road, Gujarat• Rehabilitation and upgradation of Tumkur-Sira section, Karnataka• Four-laning and strengthening of carriageway from Chennai-Tada, Andhra Pradesh• Four-laning of carriageway from Kacheepuram-Walajahpet, Tamil Nadu under Golden Quadrilateral project of NHDP
HCC	<ul style="list-style-type: none">• Mumbai-Pune Expressway, Maharashtra• East-West Corridor Project, Rajasthan• Chennai by pass project, Tamil Nadu• Four-laning of Satara-Kohlapur Highway, Maharashtra
IVRCL	<ul style="list-style-type: none">• Ramban - Sangaldan - Gool State Highway Road Project at Laole Railway Station.• Guna-Bypass project in the State of Madhya Pradesh on BOT Basis.
Afcons	<ul style="list-style-type: none">• State Highway Project in Andhra Pradesh for a total Infrastructure length of 320 Km.• East Coast Roads in Chennai for total length of 218 Km.• National Highway-45 in Chennai for total length of 160 Km.• National Highway-1 in Punjab for total length of 288 Km.
GMR	<ul style="list-style-type: none">• Tambaram-Tindivanam Expressway, Tamil Nadu• Tuni-Anakapalli projects, Andhra Pradesh• Ambala-Chandigarh

Compiled by E&Y

3. Future Funding Requirements

As per a recent World Bank study, the cumulative funding shortfall over the ten-year period is estimated at USD. 23.22 billion, approximating 39 per cent of the total requirement. The funding gap assumes that all the road user charges generated on the highways are returned to the highway sector.

4. Projected Capital Investments: Vision 2021 on Expressway, National and State Highway Network

Scheme	Period 2001-2011		Period 2011-2021	
	Length	Amount	Length	Amount
		(Rs. million)		(Rs. million)
A. Expressways	3000	300,000	7000	700,000
B. National Highways				
i) Four laning/six laning	16,000	640,000	19,000	760,000
ii) Two laning with hard shoulders	15,000	187,500	7,000	87,500
iii) Strengthening weak pavements	20,000	150,000	24,000	180,000
iv) Bypasses, bridges, over bridges, safety and drainage measures	Lumpsum	72,500	Lumpsum	92,500
v) Expansion of NH System	10,000	150,000	12,000	180,000
Total for National Highways		1,200,000		1,300,000
C. State highways				
i) Four laning/six laning	3,000	100,000	7000	250,000
ii) Two laning with hard shoulders	35,000	280,000	60,000	500,000
iii) Strengthening weak pavements	30,000	220,000	40,000	300,000
iv) Bypasses, bridges, over bridges, safety and drainage measures	Lumpsum	100,000	Lumpsum	100,000
v) Expansion of SH System	10,000	50,000	20,000	100,000
Total for State Highways		750,000		1,250,000

Source: World Bank

Realty

The realty sector in India has come of age and competes strongly with other investment options in the structured markets. The strong economic growth of the country has augured well for the Indian real estate market. Continuing bullish sentiment in the economy and slow delivery of stock on the supply side has resulted in realty prices increasing significantly in many parts of the country.

1. Housing, IT and Retail driving growth in Realty

India's property market is on a fast track, driven largely by the rapid expansion of its information technology industry, a retail boom and the simultaneous growth of its middle class population. Almost 80 per cent of the real estate development is in the residential space and rest comprises offices, hotels, malls etc. The number of households in India is expected to increase at a CAGR of 2.58 per cent owing to growth in urbanization, increasing affordability, and further nuclearisation of families. Further, factors such as lower interest rates, declining EMI rates, increasing disposable incomes, and various Government incentives are also triggering the growth in the housing sector. Most large cities, such as Mumbai, Delhi, Chennai, Bangalore, Pune and Hyderabad, are developing IT clusters, especially designed to house offices of hi-tech companies and residential townships for their employees. There is also a surge in retail development, such as shopping malls and multiplexes.

Two major reforms introduced in the real estate sector are:

- Changes in the Foreign Direct Investment (FDI) policy
- Introduction of real estate venture capital funds

2. FDI allowed under the automatic route

Post March 2005, the Government of India has decided to allow FDI under the automatic route in the construction - development sector. Though FDI was already permitted in this sector, it had to be routed, until now, through the Foreign Investment Promotion Board (FIPB).

3. Real Estate venture capital funds

The Securities Exchange Board of India (SEBI) has been firm in its stand on restricting retail investors from investing in real estate as this sector is deemed to be a speculative asset class. However, in a major policy change in April 2004, it permitted high-risk capital, Venture Capital Funds to invest in real estate. Encouraged by this policy move, several large financial firms and private equity funds have launched exclusive funds targeted at the real estate sector. This has paved the way for organised debt and equity instruments in the real estate market and the establishment of Real Estate Funds (REFs).

4. Real estate mutual funds

One of the most awaited developments for the Indian real estate sector is the entry of Real Estate Mutual Funds (REMFs) or the Real Estate Investment Trusts (REITs). REMFs in India are proposed to be structured on the lines of REITs in the US and though it has been on the agenda of SEBI for some time now, a decision regarding it is still pending. REMF is an investment vehicle that buys, develops, manages and sells real estate assets. It provides an opportunity to retail and institutional investors to include professionally managed real estate in their investment portfolio and share the gains of escalation in property prices without making large amounts of investments. As the real estate market in India expands and more foreign players make their entry, the need for transparency and disclosure requirements would become more pronounced. REMFs will mandatorily bring about these much desired changes.

5. High investment yields and capital appreciation in Indian realty

Commercial real estate continues to be a desirable investment option in India. On an average, the return from rental income on an investment in commercial property in metros is around 10.5 per cent, which is the highest in the world. In case of other investment opportunities such as bank deposits and bonds, the returns are in the range of 5.5-6.5 per cent.

Increasing demand from the IT / ITES and BPO sector has led to approximately 20-40 per cent increase in capital values for office space in the last 2-3 years across major metros in India. Grade-A office property net yields have come down from 12-14 per cent in 2003 and currently average around 10.5-11 per cent p.a. The fall in yields has resulted from decreasing interest rates and increasing appetite from investors. This has in turn resulted from abundant liquidity options available coupled with the acceptability of real estate as a conventional class of asset. The net yields (after accounting for all outgoings) on residential property are currently at 4-6 per cent p.a. However, these investments have benefited from the improving residential capital values. As such, investors can count on potential capital gains to improve their overall returns. Capital values in the residential sector have risen by about 25- 40 per cent p.a. in the last 3-4 years.

The retail market in India has been growing due to higher disposable incomes and dearth of quality space. Though the net yields on retail property have registered a fall from 10-12 per cent p.a. to 9-10.5 per cent p.a. Currently, the capital appreciation in this sector is close to

20-35 per cent p.a. Changing consumer psychographics combined with increasing disposable incomes will ensure further growth of the retail sector in India.

6. Positive outlook on the infrastructure sector to continue

As we look ahead, the expanding Indian economy, improving property fundamentals in major markets across the Indian cities and the shortage of other yield-producing assets do suggest increasing investment and capital inflow in this sector in the short to medium term. In order to inject some dynamism in the real estate market, the Government has put in place several incentives, including tax benefits. Relaxation of the external commercial borrowing norms for the real estate sector is a welcome move.

Airports

India has 450 airports managed by Government agencies such as defense services, State Governments and the Airports Authority of India (AAI). The AAI manages a total of 120 Airports in the country, which include 11 International Airports, 81 domestic airports and 28 civil enclaves. Top 5 airports in the country handle 70 per cent of the passenger traffic out of which Delhi and Mumbai together account for 50 per cent traffic.

1. Upsurge in air traffic creating under-capacity

With air travel becoming more affordable the air traffic in India is witnessing rapid growth. Though the entry of low-cost air carriers is a key factor, industry analysts attribute the boom in air travel to India's economic upswing, increased FDI in various key industrial sectors, a flood of outsourcing firms, the growing popularity of India as a tourist destination and the consequent surge in the numbers of foreign travelers arriving in the country. Passenger and cargo traffic has grown at an average of about 9 per cent over the last 10 years. The domestic passenger segment is likely to grow at 12 per cent per annum over the next few years. The estimated growth for the international passenger segment is 7 per cent while the growth for international cargo is likely to be at a healthy rate of 12 per cent. With the number of passengers in the country expected to grow from 19 million annually now to 50 million by 2010, a number of new air carriers have entered the space while several other groups are planning their foray. Airlines in India are expected to buy at least 280 new planes by 2010, worth an estimated US\$ 15 billion, and another US\$ 15 billion below worth in the following decade. Market estimates of international aircraft manufacturer Airbus Industries, indicate that demand for planes from India could grow to about 800-1,000 in the next two decades.

Presently, Indian airports face several constraints. Due to liberalization in the sector and a spurt in new airlines launching their services, the airport infrastructure is under increased pressure. The limited parking and terminal capacity, delay in passenger clearances, and bunching up of flights have led to congestion at airports. Moreover, most Indian airports lack modern ground-handling facilities, night-landing systems, and cargo handling facilities.

2. Investments through Public-Private participation

In its effort to develop airports of world-class standards, the Government is inviting private sector participation for developing the existing airports such as Mumbai, Delhi, etc as well as Greenfield airports such as Hyderabad and Bangalore. The total investments envisaged in Indian airports over the next five years are USD 5.07 billion.

3. Up gradation of metro city airports

The cost of upgrading Delhi, Kolkata, Chennai and Mumbai airports is estimated at USD 2.22 billion. The Government is keen to hand over Mumbai and Delhi airports to private parties for operations and modernization. The modernization of the two airports is estimated to cost USD 666.67 million. Private parties will recover their investment through

levying special surcharge for airport facilities. The government has appointed a consultant for the privatization process of these two airports. Similar initiatives are expected in this sector over the next 2-3 years.

4. Development of Airports

There is a wider real estate angle to the development of airports today. An estimated USD 1,650-1950 million is being planned for investment in over one thousand acres of land comprising golf courses, hotels, convention centres, malls, office space and entertainment centres at the Kolkata, Hyderabad and Bangalore airports.

Airport	Area for Commercial Development (Acres)	Real Estate Plans	% of Revenue Expected	Expected Investment (USD Million)
Bangalore	300	Hotels, Office Space, malls	N.A	400-500
Hyderabad	600-800	NA	N.A.	500-600
Kolkata	300	Golf Course, 4 hotels, convention centre	70-80	750-850

Source: Cushman & Wakefield

Special Economic Zones

The growth in industrial parks in India is being primarily driven by Government reforms through Special Economic Zones (SEZs). Presently, there are 11 operational SEZs and approvals have been granted for setting up of another 42 SEZs in the private/joint sectors or by the State Governments and its agencies on the basis of the proposals received from them.

1. Private sector investing in SEZs on a large scale

Indian and foreign companies are rushing to set up special economic zones or to convert existing projects into SEZs as a strong economy, rising investment by foreign companies and tax sops make the setting up and management of SEZs a profitable proposition. Reliance Industries Ltd. (RIL), the Anil Dhirubhai Ambani Enterprises (ADAE), Finnish giant Nokia, auto major Mahindra & Mahindra and ONGC, among others, are pouring investments and resources into building vast enclaves for industrial and commercial use which they hope will compete with China's Shenzhen Special Economic Zone, and trigger even faster economic growth. Reliance Industries, the country's largest private sector company, has already announced plans for a 15,000-acre SEZ in Haryana at a cost of USD 3.33-4.89 billion. In Jamnagar, where the company already has a large refining and petrochemical complex, RIL plans to build another SEZ to house a second 30 million-tonne refinery and another petrochemical complex. The company is also close to picking up significant stakes in the Mumbai Integrated SEZ outside the city. ADAE's Reliance Energy

has acquired about 1,000 hectares in Ghaziabad for a multi-product SEZ. ONGC is planning an export-oriented oil refinery near Mangalore and an SEZ.

The steel baron, LN Mittal's upcoming 12 million-tonne steel project in Jharkhand and Posco's similar project in Orissa, both estimated to cost over USD 8.90 billion, are likely to be declared SEZs. The rush for SEZs is chiefly because of the various tax sops announced by the government and an attempt to cash in on the growing demand for land in the country caused by higher and higher levels of investment.

Other companies setting up SEZs include Mahindra & Mahindra, which is planning to set up two projects in Chennai and Jaipur. The area covered by the Jaipur Project is expected to be over 3,000 acres and is likely to cost over USD 244.44 million. Flextronics, the USD 16 billion electronics manufacturing services provider, is believed to be building a large facility near Chennai, is intended to be upgraded as an SEZ. Other companies planning to set-up SEZs include Ranbaxy, Wipro, Zydus Cadila, Biocon, Orient Textiles, the Maharashtra Airport Development Company and the Tamil Nadu Industrial Development Corp.

2. SEZs attracting FDI too

Houston-based Hines, one of the largest privately held real estate development, investment, and management companies in the world, and SembCorp Engineers and Constructors P. Ltd., Singapore are two companies, among several others, that have shown interest in developing SEZs in India.

Government initiatives for promotion of this key infrastructure sector include:

- Automatic route available for foreign equity participation upto 100 per cent (not exceeding Rs.15 billion) for investment in the roads sector.
- Private parties allowed to develop service and rest areas along the roads entrusted to them
- The National Highways Authority of India (NHAI) is permitted to participate in equity in Build Own Transfer (BOT) projects upto 30 percent
- Investors in identified highway projects permitted to recover investment by way of collection of tolls for specified sections and periods
- 10 years of Corporate Tax Holiday to be availed in 20 years of commission of the project

Investments worth an estimated US\$34 billion needed, till 2005-06, for the development of National and State Highways. Of this figure, the requirement of private sector investment in US\$8.3 billion

Avenues include:

- Construction of highways, bridges, railway-over-bridge, elevated sections in urban areas, interchanges, bypasses, etc
- Highway related en route activities like restaurants, motels, and rest/parking areas as may be decided by the implementing agency
- Four-laning of over 15,000 km of National Highways

Select project opportunities include:

- Chennai-Nellore (US\$350 million)
- Bangalore-Chennai (US\$305 million)
- Surat-Manor (US\$180 million), and
- Jaipur-Ajmer (US\$147 million)
- Golden Quadrilateral to link the North, West, East and South (7000km by 2007)

Avenues for consulting firms:

- Feasibility studies, detailed project preparation & construction supervision

Avenues for Construction Industry:

- Contracts range between US \$ 50-200 million
- BOT projects on BOT and Annuity basis
- Participation in bonds and direct borrowings

Chapter-3

Introduction: Punjab

Punjab leads the nation in infrastructure. The Centre for Monitoring Indian Economy (CMIE) infrastructure index gives Punjab a rating of 191 – highest in the country. Even the most industrially developed State of Maharashtra figures at a low level of 111 only, against the national average of 100. Punjab has possibly the best infrastructure in terms of rail, road and transport network in the country. It scores 210 against a national average of 100 in the infrastructure index of NCAER. Mohali-Chandigarh and Amritsar are connected to rest of India by super-fast trains and domestic flights, and international connections are proximate through airports in Delhi and Amritsar (Raja Sansi Airport). Freight subsidy for export and highest road density of 95 kms per100 sq.kms add value to the robust transport network.To retain and improve upon this position, the Government of Punjab has given importance for infrastructure development through creation of PIDB. Punjab needs a heavy dose of public and private investment to develop infrastructure in the rural and urban areas of international standards. The state’s road network is in bad shape at most of the places. There is immediate need to build railway over bridges at various places. Almost all major cities and towns, which have virtually become unfit for human habitation, need about Rs 6,000 crore to provide dependable sewerage system, potable water and other facilities such as ring roads for better management of vehicular traffic. Policy leverage is required to ensure better private investment to improve infrastructure.

The specific objectives of the Punjab Infrastructure Development Board (PIDB) are as below

- a) To develop infrastructure in the State of Punjab and infrastructure facilities in the country having direct benefit to the economy of the State of Punjab. In this context, Infrastructure Development means “creation and addition” of new infrastructure facilities, replacement of existing facilities and strengthening and augmenting of existing facilities. Moreover, it shall be specifically in the following sectors:-
 - i) Transportation, roadways, including roads which may be national highways, state highways, major district roads (plan roads), other district roads, and village roads express ways, by-passes bridges, interchanges, roads over and under bridges road transport system and water transportation;
 - ii) Power generation, transmission and distribution;
 - iii) Infrastructure for information technology;
 - iv) Inland container facilities, container transport and warehousing for export purposes;
 - v) Industrial parks and Modern Industrial Townships;
 - vi) Water-supply and sewerage disposal and treatment systems, solid waste management, roads, street lights, parks and gardens and urban mass transport systems; and

vii) All other infrastructure as may be decided by the Board for betterment of the economy of the State of Punjab.

Chapter 4

Punjab infrastructure agenda VISION - 2020

- Assesses the emerging demand-supply gap in infrastructure capacity over the next 15 years (2006-2020).
- Identifies the projects that have been envisaged in various sectors for covering this gap.
- Generates a Shelf of Projects for development to be undertaken by public/private sector.
- Analyze the financial and investment implications for implementing these projects and the extent of private sector involvement necessary to achieve the same.
- Provide for inter sectoral linkages necessary with other sectors.
- Looks at various policy imperatives for translating this Vision into Reality

VISION FOR RURAL INFRASTRUCTURE

The Vision for the rural infrastructure sector of Punjab is as follows.

To mainstream rural infrastructure: Full infrastructure connectivity and services to villages.

Achieving the rural vision entails the following.

- 24 hour 3-phase power supply to all villages of Punjab
- 100% access to safe drinking water
- 100% individual toilets to rural households
- 100% all weather rural road connectivity by 2007
- 100% information connectivity to all villages and implementation of e-kiosks for bridging the digital divide
- Training rural youth on entrepreneurship and vocational avenues of employment
- Strengthening the rural healthcare delivery system – basic medical education at gram level,
- promoting telemedicine, rejuvenating primary and community health centers
- Providing complete coverage under rural health insurance schemes

VISION FOR EDUCATION

Education is one of the main pillars of all-round growth and development of any state. It greatly assists in improving the quality of life. Further it acts as a driver of creation of a knowledge-based society. In the coming decades knowledge is going to be a key driver for economic growth. To realize its aspirations, Punjab shall have to increasingly invest in building a strong knowledge workforce from trained educators, to skilled industrial workforce, to cutting edge inventors and innovators.

VISION FOR HEALTH

Quality health care services that are affordable are an important parameter for a healthy society. Health of the citizen has a significant impact on the productivity, contribution to society and overall well-being of the citizen. The state plays a key role in laying the

foundations of its health sector that can address all current and future medical needs of the state's population. Hence it is critical to develop a vision for the health sector as well as evolve a strategy to implement the vision and achieve the goals set in the vision.

Chapter -5

Infrastructure Priorities

Invest in transport infrastructure

1. Develop and substantially improve infrastructure at Chandigarh and Amritsar airport
2. Improve the transport corridors
3. Develop and maintain regional freight networks
4. Increase use of public transport

Invest in advanced technologies

1. Develop technological excellence in tourism, aviation, hotels, retail, education, healthcare etc.
2. Extend Punjab's ICT (Information and Communications Technology) capability

Invest in skills and innovation

1. Integrate and overhaul education and training facilities
2. Build precincts for research and innovation

Manage built assets well

1. Ensure efficient use of all public built assets
2. Invest in maintenance of assets

Match health and social services to community needs

1. Take primary health care into the community
2. Maintain technological excellence in hospitals
3. Address social disadvantage

Ensure energy, water and land supplies are sustainable

1. Better manage water resources, including rainwater
2. Supply affordable and reliable energy
3. Be energy efficient

Chapter-6

Infrastructure Sectors

The Strategic Infrastructure Plan presents strategies for 15 infrastructure sectors. The challenges, issues and opportunities currently faced in each of these sectors are discussed, as are the strategic directions and a number of potential projects to be pursued over the next 15 years.

- Transport
- Land
- Roads, Bridges & national highway system
- Railway system
- Power and Energy
- Water distribution systems
- Information and Communications Technology
- Aviation infrastructure
- Education and Training
- Science, Technology and Innovation
- Health
- Natural Assets

1) Transport

Waterways

There is no planned movement of passenger or freight by using inland waterways. The major river systems of Sutlej and Beas are not found suitable for transportation, the water being effectively used for power generation and irrigation purposes. The well-developed canal irrigation system could have offered some opportunity, but none of the bridges, etc., was designed for permitting any water vessels to move under them. As such transportation by inland waterways in Punjab is negligible, and future growth possibilities uncertain.

Air Transport

Punjab is served by Raja Sansi International Airport at Amritsar and the domestic airport at Chandigarh. There are smaller airstrips at Patiala, Ludhiana, etc., but only Amritsar and Chandigarh are capable of handling large commercial aircraft, with others only capable of small aircraft and helicopters. There are no mass-based air taxi services available in the state. Considering the overall socio-economic scenario and the defence requirements of air space in the border state of Punjab, this sector cannot be banked upon for any mass movement in the near future.

Land Transport

Punjab is, therefore, wholly dependent on roads and railways for its transport requirements. It is these two sectors that must provide the necessary transport infrastructure to look after the needs of the state.

- Considering its length and breadth, it should be possible to move across the state between major towns in three to four hours.
- The state capital houses the legislature, the judiciary and the administrative government centres. In addition, it houses Punjab University, and the Post Graduate Institute of Medical Education and Research. It also has engineering, architecture, medical and management institutes, which attract students and professionals. Thus movements to and from the state capital to other parts of the state will continue to remain important. However, Chandigarh is situated at the edge of the state and,

- therefore, transport infrastructure must provide a quick and reliable mode, that ensures that people can go back after business in the state capital in the same day.
- Transport infrastructure of the future must ensure quick, safe and reliable movement, while enhancing overall speed.
 - Punjab will continue to need a large amount of coal for feeding its thermal power plants. Other bulk requirements would remain in the areas of cement, steel and fertilizer. The transport sector should be capable of moving these large quantities towards the consumption centers.
 - Considering the strength of Punjab in agriculture, and the push towards agro processing, the transport sector must facilitate the movement of processed food out of the rural areas to near urban areas for final processing. There will also be need to move these quickly out of Punjab towards consumption areas in other parts of India. There would call for the availability of refrigerated containers, called 'reefers'.
 - With the advent of virtual mandis, foodgrains and other agricultural products will need to be moved from villages towards aggregation centres, for movement in bulk. The roads must be capable of handling container trucks to facilitate the same.
 - With the rapid urbanization of Punjab, expected to touch 43 per cent by 2020, it would be desirable to put in place frequent services between major towns, and suburban transportation systems in the bigger towns of Amritsar, Jalandhar, Ludhiana and Patiala.
 - Cycling remains an important mode of transport for distances up to five to six kms. While being good for the health, it also helps protect the environment. On pre-identified routes, leading from surrounding villages of the major towns, dedicated cycling tracks must be put in place to facilitate commuting by cycle.
 - Transport services should be in place to respond to the health emergencies.

Achievements

Major improvements have been made to the State's transport infrastructure in recent years.

- Chandigarh Administration has introduced a new Grid Transport System- buses plying vertically and horizontally
- Modernization of major bus stands in Punjab

Where we want to be in 2020

- Punjab will have a sustainable transport system; one that is integrated, coordinated, affordable, efficient and safe, meeting the accessibility needs of all citizens.
- Congestion on transport routes will be managed by a range of capital works projects and there will have been a shift to greater public transport use for peak-hour travel.
- A major improvement in freight movements will have occurred through greater use of rail.
- Gateways to the state will reflect vibrancy and be welcoming to visitors.
- The airport of Chandigarh and Amritsar will be a busy import/export airport for the state as a result of improved services to ensure the efficient transport of goods and passengers.
- Introduction of mono rail system

2) Land

Achievements

The public and private sectors both play significant roles in the release and development of industrial and residential land throughout the state. The majority of residential land development projects are undertaken by the private sector. Government, in some instances, undertakes joint-venture activities with the private sector to facilitate social and environmental outcomes that are considered important for the wider community.

Where we want to be in 2020

Residential plots of various sizes, commercial shops, booths etc to be developed.

The roads, electrification, water supply, sewerages, Storm water drainage

Development of special parks

Construction of Bus-stand

Indoor Stadium

Community Center cum Swimming Pool to be developed

URBAN INFRASTRUCTURE SECTOR Vision 2020

The vision for the urban sector is to make urban areas productive, efficient, equitable and environmentally sustainable contributing to improved quality of life through strengthening of local urban authorities and their empowerment. The objectives of the vision are as follows.

- To make cities clean, liveable, productive and self sustaining
- To ensure quality of life and excellent infrastructure (30 towns in the short term)
- To develop Amritsar, Mohali, Ludhiana, Jalandhar and Patiala, into world class cities
- To transform the urban sector through reforms and infrastructure development
- To attract maximum private investment into the urban sector

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- 100% access to safe drinking water
- 100% individual toilets to rural households
- 100% all weather rural road connectivity
- 100% information connectivity to all villages and implementation of e-kiosks for bridging the digital divide
- Training rural youth on entrepreneurship and vocational avenues of employment.
Strengthening the rural healthcare delivery system – basic medical education at gram level, promoting telemedicine, rejuvenating primary and community health centres
- Providing complete coverage under rural health insurance schemes

3) Roads, Bridges & National highways



National Highways serving Punjab

The total length of these national highways in Punjab is 977 kms. These highways are also of a strategic nature, considering the status of Punjab as a border district, important for the defence of the nation. National Highway No. 1 also connects Jammu & Kashmir, approached via Jalandhar and Amritsar. National Highways are maintained by the government of India and serve Punjab well.

State Highways and Major District Roads

These arterial roads, referred to as plan roads, are maintained by the PWD Department of the Punjab Government and are spread over the total length of 7,305 kms. Of these, 2,166 kms are state highways, 1,799 kms are district roads, and 3,340 kms are other district roads. As can be seen from the map, the state highways network is fairly extensive. Some of these roads, owing to their importance, are being elevated to the status of national highways. The important plan roads under this account are likely to be:

- Kiratpur Sahib-Anandpur Sahib-Nangal Road.
- Chandigarh-Patiala-Sangrur-Barnala-Bhatinda Road.
- Kharar-Ludhiana-Moga-Ferozepur Road.
- Ropar-Hoshiarpur-Dasuya-Mukerian-Gurdaspur-Kathua Road.
- Jalandhar-Nakodar-Moga-Sangrur-Patran-Narwana-Rohtak-Delhi Road.

- Bathinda-Fatehabad Road.

National Highways Serving Punjab

NH No.	From	To	Length (kms.)
1	Shambu (Haryana Boundary)	Ludhiana - Jalandhar - Amritsar - Pakistan Border	279.42
1-A	Jalandhar	Tanda - Mukerian - Pathankot Samba (excluding Himachal Pradesh Portion)	104.734
10	Dabwali (Haryana Boundary)	Malout - Abohar - Fazilka (Pakistan Border)	109.06
15	Pathankot	Gurdaspur-Amritsar-Zira-Faridkot-Bajakhana-Bathinda-Malout-Abohar-Usmankhera (Rajasthan Boundary)	363.67
20	Pathankot	Chakki (Himachal Boundary)	11.975
21	Zirakpur (Excluding U.T. Area)	Mohali-Kharar-Ropar-Kiratpur-GarhaMora (HP Boundary)	76.88
22	Ambala Barrier (Haryana Boundary)	Zirakpur-Kalka (Haryana Boundary)	30.99
			Total = 977 kms.

Source: www.Punjabgovt.nic.in, (PWD Department, B.R.)

The major artery is national highway No. 1, also known as the Grand Trunk Road or Sher Shah Suri Marg. Entering at Shambu, it runs through Punjab, and right across to the Wagha Border with Pakistan. This connects the major towns of Ludhiana, Jalandhar and Amritsar along with the industrial townships of Sirhind and Govindgarh. A number of state highways also branch off to other major towns, such as Ferozpur, Patiala, Bathinda, Hoshiarpur, etc.

Link Roads Connecting Villages

All villages of Punjab are connected by link roads, running for 31,657 km. The standard design is that the link road touches the village, goes around it and leaves to connect the next village. The part of the road going around the village is called 'Phirni', with usually two to three bus stoppages located at convenient points. Rarely do these link roads enter the village. The village is served by brick-laid lanes that connect to the Phirni.

Road Sector

The plan and link-road network is serving Punjab well. However, the design of these roads and technical specifications do not permit regular movement of heavy vehicles. As a result these roads usually become unserviceable during the monsoons, and consume large amounts of money in their maintenance. It is desirable that the concept of life cycle costing instead of immediate cost should be applied, which will show that the long-term cost of building a more expensive road may be lower than a cheap road with high maintenance cost. It should also be appreciated, that as in the telecom sector, in the road sector too, the last mile is as important as the major back-bone. It is found that while much attention is being paid to national highways and state highways, the links of these roads to the rural areas leave much to be desired. In a future scenario, where the Punjab Government is targeting growth in agro-processing industries, the village has to be well linked and integrated into the road transport infrastructure, through wider roads that are capable of taking heavier axle loads than at present. The link road also witnesses a large movement of

tractors. The tyres of these vehicles are intended for off-road use and, therefore, exert greater wear and tear on metal roads than other vehicles. Therefore, it is all the more important that the village roads are designed well and built to last for taking these demanding loads. A number of road improvement projects are required.

Achievements

Where we want to be in 2020

The vision for the road sector of Punjab is as follows.

- To create a robust road network with adequate capacity linking all growth centers of the state
- To facilitate speedy evacuation of food grain within 12 hours from its state boundary
- To provide for an average speed of 60 kmph
- To ensure 100% all weather paved roads
- To ensure 100% rural connectivity
- Expressways in Punjab to promote integrated industrial, commercial and residential growth in the area
- Up gradation to four-six laning of all the National Highways passing through Punjab
- Improvement of riding quality & strengthening of national highways
- Construction of road over bridges on national highways

4) Railways

There are 3,664 track km. of railway track in Punjab. As can be seen from the railway system map of Punjab, the major double line railway artery runs parallel to National Highway No. 1, all the way from Shambhu to Amritsar. From here there are two main branches, one going towards Patiala, Bhatinda, Abhohar and the other moving towards Moga and Ferozpur. The third branch takes off from Jullundhar and moves towards Jammu. There are many other small branch lines connecting the foodgrain-producing mandis of Punjab, primarily to assist in loading and movement of wheat and rice to other parts of India. The capital city of Chandigarh is connected by a line branching off from Ambala and moving towards Chandigarh via Lalru. One of the major sanctioned projects for new railway works under execution by Northern Railway is the Chandigarh-Ludhiana rail link, already completed upto Morinda junction.



5) Power and Energy

Achievements

The major reasons for inadequate, erratic and unreliable power supply are:

- Inadequate power generation capacity;
- Lack of optimum utilization of the existing generation capacity;
- Inadequate inter-regional transmission links;
- Inadequate and ageing sub-transmission & distribution network leading to power cuts and local failures/faults;

- Large scale theft and skewed tariff structure;
- Slow pace of rural electrification;
- Inefficient use of electricity by the end consumer.

Strengths and opportunities in the sector

- Abundant coal reserves (enough to last at least 200 years).
- Vast hydroelectric potential (150,000 MW).
- Large pool of highly skilled technical personnel.
- Impressive power development in absolute terms (comparable in size to those of Germany and UK).
- Expertise in integrated and coordinated planning (CEA and Planning Commission).
- Emergence of strong and globally comparable central utilities (NTPC, POWERGRID,).
- Wide outreach of state utilities.
- Enabling framework for private investors.
- Well laid out mechanisms for dispute resolution.
- Political consensus on reforms.
- Potentially, one of the largest power markets in the world.

Objectives

- To provide 'Power on Demand by 2012'.
- To make the sector commercially sound and self-sustaining.
- To provide reliable and quality power at an economic price.
- To achieve environmentally sustainable power development.
- To promote general awareness to achieve consensus on the need for reforms.

Resources and Current Availability

Energy is one of the most vital inputs; it literally fuels the engine of progress and development. It can be tapped from both renewable and non-renewable resources. Availability of the primary sources of energy in Punjab.

Primary Sources of Energy

Renewable

Hydro-power	Yes
Biogas	Yes, limited
Solar	Yes
Wind	Negligible potential
Geo-therma	No
Tidal	No
Non-renewable	
Coal	No
Oil	No
Gas	No

Nuclear energy as an energy source is not considered on account of it being ruled out for strategic reasons, as Punjab is a border state. Considering the resource base, Punjab should concentrate on mini-and micro-hydel schemes, solar and biogas areas in renewable energy. In the case of non-renewable sources, coal is already a major source of energy. Punjab is heavily dependent upon Guru Gobind Singh TPP at Ropar and Guru Nanak Dev TPP at Bathinda, and is also in an expansion mode for further units at Guru Har Gobind Singh TPP at Lehra Mohabbat. Thermal power continues to be the major supplier of energy in the state. Since 1997, thermal power has become the mainstay of electrical energy availability in the state.

Electrical Energy Availability (in million kwh)

Year	Thermal Generation	Hydro Generation	Purchased	Total
1991	5426	7540	2515	15481
1996	7534	7557	4972	20063
1997	8978	7616	5084	21678
1998	9121	6806	6617	22877
1999	9989	8808	6296	25093
2000	12641	7739	6108	26388
2001	13217	7063	6892	27172
2002	13198	6967	6830	26995

Source: Punjab State Electricity Board

Punjab also purchases power from outside, notably from Baira Siul, Singrauli thermal, Salal hydel and others. State's self-generated thermal power accounts for 50 per cent of total power availability, 25 per cent is from self-generated hydel sources, and the remaining 25 per cent being purchased from outside.

While electrical generation is growing at an overall rate of 7.5 per cent, the major growth is in the thermal and nuclear sectors. With nuclear power ruled out, and mega hydro project power availability in the near future uncertain, Punjab has moved on the right track of building up a thermal generation capacity.

Total Expected Availability

Even if we factor that another 1,000 million units are being made available/saved through micro-hydel and renewable energy sources such as solar power and biogas, it becomes clear that self-sufficiency in energy cannot be achieved. Even today, Punjab is buying power from the grid, and it shall continue to do so. In fact, this will increase, anticipating further growth in demand for power, as realized from an analysis of consumption trends. The total likely availability of power from the state's own resources by 2010 would be-

Conceptual Framework of Availability of Power from the State's Own Resources by 2010

Generation	Units
Thermal at 68% PLF	16000
Hydel	7000
Non-conventional resources, micro-hydel	1000
Enhancement of PLF to 80% plus	1500
Minus T&D losses @ 10%	2550
Total	23000

Consumption

Punjab has the highest per capita consumption of electricity among all states in India, at 904.58 kwh per year. It achieved 100% electrification in 1980.

Annual per Capita Consumption of Electricity by States 1999-2000 (million kwh)

State	Domestic light and small power	Commercial light and small power	Industrial	Public lighting	Agricultural	Total
Andhra Pradesh	63.57	12.77	114.05	3.97	133.4	327.80
Bihar	10.52	4.19	85.04	0.45	15.39	115.59
Gujarat	83.83	29.11	261.46	3.29	311.40	689.09
Haryana	105.93	19.74	126.66	1.57	232.80	486.70
Karnataka	63.04	10.14	90.83	3.18	181.72	348.91
TamilNadu	70.96	40.90	217.75	4.07	120.46	291.72
Maharashtra	102.81	27.68	251.02	5.59	116.24	503.34
Punjab	161.31	34.11	355.19	2.58	351.39	904.58

Source: Central Electricity Authority

Sub-sectoral Break-up of Power Consumption in Punjab, 1970-71 to 2000-01 (Percentage)

	1970-71	1980-81	1990-91	1998-99	1999-00	2000-01
Domestic	9.77	11.74	13.60	18.43	18.06	22.02
Commercial	5.22	3.29	2.74	3.85	3.82	4.74
Industrial	35.96	38.09	36.26	36.58	36.78	41.95
Public lighting and bulk	11.05	3.27	4.53	2.04	2.01	2.44
Agriculture	38.00	43.66	42.87	39.10	39.33	28.85

Source: Economic and Statistical Organisation

Thus, growth of demand from domestic households can be anticipated as we move towards real 100 per cent use of electrification. This trend will be more pronounced because Punjab is quickly moving to being one of the most urbanized states in the country. In 1951, there

was 22 per cent urbanization; this had jumped to 34 per cent in 2001, and is further expected to touch 45 per cent by 2020. This implies that out of the current population of 2.25 crore, 0.77 crore are urbanized. This figure will move to 1.92 crore with the expected population of 4.26 crore in 2020, as against 2.34 crore in rural areas. Thus, while net addition to rural population will be 0.87 crore, urban figures will go up by 1.15 crore. The clear ramifications of this are:

- Domestic sector will need and demand 100 per cent electrical supply.
- Since urban consumptions are higher than rural, we can expect an increase in per capita power consumption.

The domestic sector uses 4,400 million kwh of power, and we can expect an additional annual demand of about 400 million kwh every year, doubling the total requirement to about 8,500 million kwh by 2010, while the population will double after 2020.

Commercial supply: The commercial sector consumes about 1,000 million units. With increased urbanization, such commercial activities as trading, health services, retail outlets, etc., will increase at a fast pace. Until now, this sector has remained largely stable in its power consumption, even going down at certain times. It will now add to its consumption as an important growth area in the tertiary sector. There is also a trend towards energy-consuming displays, and an affinity for air-conditioning the commercial setup to attract customers. It is anticipated that in keeping with global trends, the commercial sector will demand extra energy. Since Punjab anticipates growth in the tertiary sector services market, it would be necessary to plan for an additional requirement of 250 million kwh per year till 2010. The commercial sector will thus need 3,500 million kwh per year.

Industrial supply: No major industry, other than the Hindustan Petroleum refinery, is slated for Punjab. At present, it is planned with a captive power plant to trap released gases and byproducts and become a power-surplus unit. For the last decade, the industrial sector has been demanding extra energy at the rate of about 400 million kwh additional units every year. The consumption in 2000-01 was 8,000 million kwh, and plans should be made keeping the same in mind. Thus, the industrial sector will need 12,000 million kwh per year in 2010.

Public lighting and bulk: Public lighting and bulk-sector demand remains at 500 million kwh. The major addition to this is the bulk demand from the Northern Railway, with electrification-sanctioned upto Amritsar. It is anticipated that further electrification projects will be taken up to handle the suburban and inter-city passengers of Punjab's metropolitan and other large towns. After discussions on this with the Railways, it would be wise to add 1,000 million kwh in this segment by 2010.

Supply to agriculture: The agricultural sector today needs about 5,500 million kwh. This demand has been going down in recent years, with the peak at 8,200 million kwh. Undoubtedly, it is linked to the demand for water, and thus is a correlate of rainfall and availability of assured irrigation. Its decreasing demand is on account of a succession of good monsoons, and the area under irrigation increasing from 57,81,000 hectares in 1980 to 75,44,000 hectares in 2000. However, the rains can always fail, and though the demand in this sector is not likely to increase from its peak of 8,200 million units, at least this much should be planned for as being available for this sector. At present too, with the failure of the monsoon, a large demand has been generated in the agricultural sector, and urban domestic and industrial supplies have been badly disrupted.

Total Demand: In keeping with international demand trends, over the decade from 2010 to 2020, the overall demand is likely to double, and stand at 68,000 million kwh.

Anticipated Demand for Energy (in million kwh)

Sector	Demand in 2010
Domestic	8500
Commercial	3500
Industrial	12000
Public lighting and bulk	1500
Agriculture	8500
Total	34000

Source: *Economic Survey of Punjab*
Punjab State Electricity Board

Even for a time horizon of 2010, the anticipated demand for electrical energy is anticipated at 34,000 million units against a likely self-generation of about 23,000 million units. To cover this shortfall, Punjab will need to put in place an additional 3,000 MW of generating potential at PLF of about 80 per cent. This large chunk is nowhere in sight, and there is no possibility of generating the anticipated 68,000 million kwh by 2020. Environmental concerns also dictate that Punjab should seriously evaluate the effects of setting up more thermal-based generation capacity.

Punjab must accept the fact that in the conceivable future, it will always be shopping for power on the national grid. This would appear to be in the interest of both the state and the nation, with a number of power surplus states, central sector generating units in a position to sell, IPPs, and the emerging road map in the power reforms sector.

Encouraging FDI in Transmission

Out of the Rs. 8,00,000 crores required for doubling the power capacity to 2,00,000 MW by the year 2012, about Rs. 2,00,000 crores would be required for the associated transmission system including creation of a National Grid. Out of this, an investment of about Rs.70,000 crores would be required in Central Sector Transmission Systems alone. POWERGRID is expected to mobilise an investment of Rs.41,000 crores from its own resources. The balance requirement of Rs.29,000 Crores is proposed to be mobilised through private investments. Considering the scale of investment and the volume of expansion required, attracting large private investment in transmission is essential.

Where we want to be in 2020

Formation of a strong National Grid to remove inter-regional imbalances.

6) Water distribution systems

The state of Punjab has total population of over 24.3 million and encompasses an area of app. 50,400 square kilometres. Being an agriculture state the majority of the population is rural. App 70% of the Punjab population lives in villages. There are 12428 main habitations (villages) in Punjab as per 1991 census out of which 12250 are inhabited villages having total population of 16.04 millions scattered throughout its 17 districts. the rural population depends on ground water / canal water to satisfy its need of drinking water for human and live stock consumption. people have to travel long distances i.e. 2 to 3 kilometres to obtain drinking water in certain areas of Kandi Belt. women have to bear the burden of carrying water for long distances. In addition, 95% of Punjab's rural population lacks sanitation facilities and this condition contributes to biological contamination of run off water and underground water

during the rainy season which causes chronic diarrhoea and other water borne diseases which are particularly to the health of infants.

In the Northern and Central districts of the State, portable water is available in shallow / deep aquifers but this is not dependable for drinking due to the possibility of contamination of shallow aquifers by the discharge of untreated industrial / polluted waste water. In the southern districts of the state the underground water contains high fluoride and chloride concentration that render the water unsafe for portable use. The high concentration level of fluorides contribute to a high incidence of flourishes in these areas. Drinking water in the southern districts is only available from the existing irrigation canals of the Indus river system. However, the supply of canal water is not continuous. Therefore water storage is necessary to achieve the continuous water supply. In addition the irrigation canal water has turbidity that requires treatment. Due to rise in water level the cost of civil structures has become exorbitant. Therefore, the system of installing portable filtration plants is being adopted. De-fluoridation plants etc. are proposed for treatment of water at some places on pilot basis. The existing water supply systems are designed to provide 40 / 70 litres per capita per day portable water for prospective population of 15 years.

During surveys held in 1980, 1985, 1992 and 2002 a total number of 11849 main habitation (villages) and 1047 other habitations were identified as problem habitations as per drinking water standards laid down by the Government of India described as follow:

Type of Scarcity	Description
A	The drinking water source / point does exist within 1.6 km of the habitations in the plains or 100 m elevation in the hilly areas. The source / point may either be public or private in nature however, habitations drawing drinking water from a private source may be deemed as covered only when the water is safe, of adequate capacity and , is accessible to all (category 1).
B	Habitations which have a water source but are effected with quality problems such as excess salinity, iron, fluorides, arsenic or other toxic elements or biological contaminated. a) Villages / habitation having Fluorides in available water more than 1.5 ppm (category II-A) b) Villages / habitation having Fluorides in available water 1 to 1.5 ppm (category II-B). c) Villages / habitation having total dissolved solids in available water more than 1500 PPM (category II-C). d) Villages / habitation having total hardness in available water more than 600 PPM (category II-D). e) Villages / habitation having total dissolved solids in available water between 500 PPM and 1500 PPM (category II-E). f) Villages / habitation having total hardness in available water between 200 PPM and 600 PPM (category II-F). a) Villages / habitations having iron > 1ppm

	(category II-G) h) Villages / habitations having iron between 0.1 to 1 ppm (category II-H)
C	Habitations where the quantum of availability of safe water from any source is not enough to meet drinking and cooking needs.

Major Achievements

Rural Water Supply Program : Under this program piped water supply has been provided to 7857 villages and 465 other habitations (March 31,2002 figure), covering a population of 105 lacs at a cost of Rs.600 Crores. Department supplies 420 million litres of safe and treated drinking water per day to the rural population of State.

Water for the Capital : The first and 2nd phases of the augmentation of water supply scheme Chandigarh (pumping 40 MGD of water through twin 28 Km Lines from Bhakra Main Line at Kajauli to Chandigarh) has been executed and are being operated and maintained by the Department.

Deposits works: The Department has executed the water supply/sewerage/storm drainage works of S.A.S. Nagar and Ranjit Sagar Dam Project etc. and operates maintains Public Health Engineering Services as deposit works on behalf of these organizations.

Major Schemes/Projects

(A) Providing Water Supply to Union Territory of Chandigarh:

The work for laying of pipeline of 20 MGD capacity , costing Rs. 31.28 crores, in the 4th phase, has been entrusted to Public Health Department. The tendering process for the same has been started and the work will be commenced shortly.

(B) Rural Water Supply Scheme

a) District Level Schemes:

1. Minimum Needs Program (MNP)

A provision of Rs. 600.00 lacs has been made in the annual plan for the year 2002-2003 under Minimum Needs Program (MNP) with which it would be possible to cover 165 Not Covered villages.

2. Augmentation Rural Water Supply Schemes Kandi Area

Water Supply level in 850 villages falling in kandi area of the State, which were covered with piped water supply more than 20 years ago has reduced from the standard norm of 40 lpcd. In order to ensure water supply as per Government of India norms i.e. @ lpcd from the old rural water supply schemes in Kandi Area, there is urgent need to augment Water Supply Schemes in all affected villages. Under this program since its inception in 1993-1994, till date 175 Rural Water Supply Schemes covering 317 villages have already been augmented. a provision of 200.00 lacs has

been made for the year 2002-2003 with which it would be possible to augment another 64 villages. During 2001-2002 also a provision of Rs. 200.00 lacs was made.

3. Augmentation Rural Water Supply Schemes other than Kandi Area

Public Health Department has identified 3123 number of villages, where service level has gone below 40 lpcd and which have come into the category of Partially Covered (PC) habitations. Out of this 850 villages fall in Kandi Belt and remaining 2273 villages fall in other kandi areas of the State. Rural Water Supply Schemes for PC villages are required to be augmented up to 40 lpcd level to improve service level. 292 number villages covering 132 schemes have already been augmented under this program till date since the inception of this program. In order to tackle the balance problem at the earliest possible, a provision of Rs. 400.00 lacs has been made for the year 2002-2003 to improve the service level at least in 90 PC villages.

4. Providing water supply to villages having population more than 5000 persons

Rural water supply schemes are being executed to provide portable water to the problem villages. However, there are many non-problem villages which due to their nearness to the main roads / towns and development of rural industry have grown in population ranging from 5000 to 15000. These villages do not have notified area committees, which can generate resources and provide basic services. The panchayats too do not have the requisite resources to provide necessary civic amenities relating to drinking water and suitable disposal facilities. The environment in such village is fast deteriorating and there is an ever-increasing danger to the health of the people living in such rural areas. In view of above problem, Punjab Government introduced the scheme for the implementation of rural water supply for Non-Problem Villages (NPV) during the year 1991-1992. An allocation of Rs. 100.00 lacs has been made under this scheme for the year 2002-2003 with which it will be possible to cover 8 more villages

5. NABARD Projects

To accelerate the provision of potable water to NC villages and augment the existing Rural Water Schemes, projects costing Rs. 165.67 Crores., covering 1002 villages in the districts of Patiala, Ropar, Gurdaspur, Hoshiarpur, Nawan Shahar, Bathinda, Ludhiana, Fatehgarh Sahib, Sangrur and Kapurthala of Punjab, have been got approved from NABARD during 2000-2001 and 2001-2002. 90% of the project cost is loan from NABARD at the rate of interest 0.5 to 11.5%, while balance 10% is to be contributed by State Government. Work in these villages is in progress. Additional 6 projects costing Rs. 148.62 Crores covering 787 villages are likely to be got approved during 2002-2003.

6. Prime Minister Gramodaya Yojana (PMGY) Rural Drinking Water Supply

Government of India, in year 2000-2001, have introduced a new scheme in the form of Prime Minister's Gramodaya Yojana (PMGY) in order to expedite the provision of Safe Drinking Water Supply to all habitations. The PMGY envisages allocations of Additional Central Assistance (ACA) to States and UTs for selected basic minimum services. ACA received under PMGY schemes contains 30% as grant from Government of India and 70% loan to the State Government.

During 2002-03 an allocation of Rs. 1000.00 lacs has been made for the completion of work in on going 227 villages in the districts of Patiala, Ropar, Fatehgarh Sahib, Sangrur, Ludhiana, Ferozepur, Gurdaspur and Amritsar.

7a. Augmentation of Water Supply at Talwandi Sabo

The underground water in large areas in Bathinda and Mansa districts contains excessive fluorides and high concentration of salts, which render the underground water unfit for potable use. Therefore, the drinking water supply scheme of Talwandi Sabo, District Bathinda has been based on canal water.

Drinking water supply scheme for the town is already existing but the town is growing at a fast rate. Now the present population is 21000. A new project to augment water supply scheme amounting to Rs. 387 lacs for a prospective population of 27000 has been approved by Govt. of Punjab. In this project the town has been divided into two zones, Zone 1 is to cater to a population of 12000 and Zone 11 will cater to another 15000 persons. A new water works is under construction on the Nut Road. The work is in progress and is likely to be completed by September 2003, depending upon the timely availability of funds.

7b. Installation of Innovative Transportable Treatment Plant at Talwandi Sabo

Department, with the help of Republic of Uruguay, has installed a Transportable Treatment Plant at Talwandi Sabo. The conventional water treatment plants require large areas of land ranging from 4-5 acres for constructing storage and sedimentation tank, High-level tank, filter beds, clear water tanks etc. The land requirement for constructing high level tank and filter beds in conventional system is of about 3-4 canals whereas land requirement for installing portable filtration plant is about 50 sqm only, because the size of the plant is small having dimensions of length 6 m, Breadth 1.5 m & depth 2.5 m. The complete unit can be installed on a platform of 10mx3m. Thus the land requirement is very little as Compared to conventional plant.

This modern "portable water treatment plant model 2000" has a high rate of filtration and is capable of removing bacteria, viruses, parasites, protozoa's effectively. The recurring cost of the system is quite comparable to the conventional plant. The main feature of the plant is that various treatment process, such as coagulation, flocculation, sedimentation and filtration are integrated in one compact unit which is manufactured from stainless steel. The rate of filtration is 60-70 times more than the conventional slow sand filtration plants. It can supply 20 m³ of filtered water per hour which means that the plant has a capacity to supply 4 lac litre of water per day. Moreover the plant can easily be dismantled, shifted and installed at another place in a short period of 7 to 10 days.

b) Centrally Sponsored Schemes (Rural Water Supply)

Accelerated Rural Water Supply Program

Taking into account the magnitude of the problem and to accelerate the pace of coverage of problem villages, the Central Government introduced the Accelerated Rural Water Supply Program (ARWSP) in 1972-73 to assist the State and Union Territories with 100% grant -in-aid to implement the schemes in such villages. It is proposed to cover 696 (Not covered habitations), 130 other habitations, under

ARWSP and cover 150 RWS Schools with Rural Water Supply Schemes under ARWSP DURING 2002-03 at an estimated cost of Rs. 8500 lacs.

Sector Reforms Project

Government of India introduced a new scheme in the year 1999-2000 to institutionalize community based Rural Water Supply Program by actually involving local community. The project has been named as Sector Reforms Project to implement the reforms process and to test check the project concepts. All over the country 63 districts have been brought under this project. Three districts of Punjab state, namely Bathinda, Moga and Muktsar were brought under Sector Reform Project. As per funding pattern of the Project, Government of India will provide 90 % of the funds whereas remaining 10 % will be contributed by the local community for providing the water supply scheme at a water allowance of 55 lpcd. after the completion of schemes, 100% Operation and Maintenance cost would be borne by the community. If the service level is to be enhanced to, for 70 lpcd, the beneficiary share contribution will be 12.5% and for 100 lpcd, it will be 15%.

Computerisation project

The Government of India has introduced computerization in the Government offices to increase the efficiency and as accorded approval for the computerization project costing \$s. 50.84 lacs, which was to be shared, by GOI and State Government in the ratio of 80:20. The funds have since been released to the Public Health Department by the Finance Department and the computers have been procured. The 2nd phase of computerization project costing Rs. 148.79 lacs is in the final stage of implementation.

Future Projects

World Bank Project

An integrated project for providing Rural Water Supply with the service level of 100 lpcd along with provision of Environmental Sanitation facilities in 600 villages of Punjab State costing Rs. 617 crores was appraised from the World Bank in January 1997 for seeking loan assistance. However, project could not take off due to some policy decisions. Now the Government is again taking steps to revive the project and suitable steps are being considered for this. This will enable the Department to revive the integrated Rural Water Supply & Environmental Sanitation Project. Once the World Bank agrees to revive the Project, Public Health Department intends to cover 600 villages under phase-1 and 1860 villages under phase-II at an estimated cost of Rs. 2400 crores.

The Vision 2020 for the drinking water sector in Punjab is as follows.

- To provide access to safe drinking water in adequate quantity on assured basis to all people in Punjab thereby reaping the direct and indirect socio-economic benefits of a society that has access to plentiful water

7. Information Technology and telecommunication

To maximize their creative potential and be on the cutting edge of technology & innovation. Providing a single-point interface to rural communities for their information and transaction needs in all facets of the rural life.

IT's happening right at your doorstep. In what promises to give a major fillip to the booming software industry, the Mohali centre of Software Technology Parks of India (STPI) has clocked the highest export figures in the last seven years. Riding high on the technology bandwagon, software exports from Chandigarh and Mohali have touched the dream figure of Rs 263.16 crore in the last fiscal. This is a whopping 48 per cent rise compared to the total volume of exports in 2003-04, which stood at Rs 182.55 crore.

Going by the rate at which the software industry is growing here, we hope to surpass Rs 350 crore-worth exports in 2005-06 even by conservative estimates. Within the next three years, exports are expected to touch Rs 1,200 crore. We have 220 companies registered with us; 75 are exporting while the rest are in the gestation period. Once they take off, one can well understand what the export growth would be," he says. While software giants like Infosys, Quark Media, IDS Infotech, Konstruct Systems, Tata Interactive Services, SmartData Enterprises, MSI Systems Corporation, Net Solutions, Trident Infotech and eThree Infosystems are already operating from STPI, Wipro has already submitted an Expression of Interest to STPI. "TCS and Covergys are also in the pipeline and IBM Daksh is looking for space already. They are eyeing ready-built space in the Chandigarh Technology Park," says Tyagi. Of the 114 acres in STPI, Infosys has already taken 35 acres, and 14 acres are with DLF in conjunction with UT Administration. With the software industry employing close to 8,000 persons here already, employment avenues are set to broaden. That apart, there are add-on benefits. "Be it the coming of the Taj to Chandigarh or the proposal to convert the city airport to a state-of-the-art international terminal, it's all because of IT. We have been crying for the four-laning of the Ambala-Chandigarh highway for the last seven-eight years. Now the project is on track. Why? Because of IT only," he emphasises. What is it that is drawing large and small players to set up units here? "The governments of both Punjab and Haryana as well the UT Administration are very responsive to the needs of the IT industry. While Chief Minister Capt Amarinder Singh has promised about 1,000 acres for IT, we have talked with the Administration about providing land beyond the CTP at Kishangarh and are looking at about 300 acres. We are also in discussions with Haryana and are telling them to promote Panchkula as a favoured destination and encourage those who already have units in Gurgaon to move in here as well. The Haryana Government too has earmarked space for IT industry in Panchkula," remarks Tyagi.

Panel to co-ordinate

To further boost software exports, a co-ordination committee has been made with the initiative of UT Administration, where IT Secretaries of Haryana, Punjab and Chandigarh would be members and STPI, the convener. The industry is considered as having the highest potential for investment in India. The

growth in demand for telecom services in India is not limited to basic telephone services. India has witnessed rapid growth in Cellular, Radio Paging, Value-added services, Internet and Global Mobile Communication by satellite (GMPCS) services. This is expected to soar in the next few years. Recognizing that the telecom sector is one of the prime movers of the economy Government's regulatory and policy initiatives have also been directed towards establishing a world class telecommunications infrastructure in India. The telecom sector in India therefore offers an ideal environment for investment.

The Government of Punjab has been making efforts to promote IT in the State with the objective of improving the state of economy, enhancing the quality of life of the citizen, provide good governance, and ensure development with equity. Some of these efforts are attracting investments in IT Sector, implementation of electronic governance projects and promoting IT education. Besides these ongoing efforts the Govt. of Punjab is committed to encourage distance education through use of IT tools, IT enabled services for providing large scale employment and also to take internet to the villages at the earliest to spur the growth of e-commerce in rural areas also.

The above efforts essentially need availability of a robust telecommunication infrastructure with adequate band-width across the length & breadth of the State. At present, DoT is the predominant agency operating, through-out the State. It is felt that the efforts of DoT will have to be supplemented to create enough bandwidth and make it available at affordable rates. Hence, the government has been contemplating to leverage Private Sector initiatives in providing widespread, high speed, broadband communication infrastructure speedily.

The globally accepted method of creating broadband network is through laying optical fibre as the backbone. The optical fibre is to be laid along roads/properties like the National Highways, State Highways and other roads/communications/power network belonging to PWD (B&R), Punjab Mandi Board, PUDA PSEB, Municipal Committees/Corporations and Forest Department etc. The agencies intending to lay the Optical Fibre Cable (OFC) are required to take permissions from the authorities in these departments. In the absence of general guidelines, the proposals are sent to higher authorities and this cause delay. Keeping this in view, the Government has decided to issue guidelines for issuing permissions to the agencies, especially telecom service providers desirous of implementing optical fibre projects in the State.

Where we want to be in 2020

Strategic Interventions

The key strategic interventions required to achieve the vision are as follows.

- Government should plan for a completely network society by providing cost-effective broadband connectivity and exploring other technology options.
- Government in association with Bharat Sanchar Nigam Limited (BSNL) and other telecom companies should plan for infrastructure to enable a tele-density of 70 by 2020 from existing 12 per 100 persons.
- Promotion of Telecommunication Infrastructure, by Laying of Optical Fibre Cables along the State Properties. Connecting all villages of Punjab through Internet.
- The rural-urban digital divide should be bridged through schemes of Village Public Telephones and e-kiosks.
- ICT integration should be part of research programs of all Centers of Excellence across sectors to derive productivity benefits.

- Government of Gujarat should pursue with Government of India/BSNL for 100% Village Public Telephones connectivity under GoI rural telecom connectivity initiative

8. Aviation infrastructure

In the area of civil aviation, domestic passenger traffic grew sharply by 24 per cent in 2004-05 to 39.9 passengers as compared with a 13 per cent growth in the previous year. International passengers traffic rose by 17 per cent in 2004-05 to 19.4 million persons. Total Air Cargo handled reached to 1.28 million tones in 2004-05 from 1.07 million tones in 2003-04 recording growth of 20 per cent. Domestic Cargo recorded growth of 21 per cent by reaching 0.46 million tones from 0.38 lakh tones in 2003-04. International Cargo recorded a growth of 19 per cent by reaching 0.82 million tones in 2004-05 from 0.69 million tones in 2003-04. The huge growth has encouraged new airlines to fly on the Indian sky and to enter the Indian market. India has an advantage in offering multiple destinations. The government has allowed complete open skies for foreign carriers. **Government has allowed domestic private airlines to operate on international routes, except gulf countries, subject to some minimum conditions.** In our journey towards the twenty-first century when the Indian economy is all set to integrate itself into the global economy, the upgradation and modernisation of infrastructure and its efficient use have assumed critical importance. It is now increasingly recognised that aviation, far from being a mere mode of transportation for an elite group, is crucial for sustainable development of trade and tourism. In this context, it is vital that airport infrastructure grows in anticipation of the escalating needs of the air transport industry. As this is a capital-intensive sector, there is an obvious need for perspective planning with a vision for the next twenty years and to muster the combined resources of the public and private sectors, both domestic and foreign.

Role of Airport of Infrastructure in National Economy

Airports being nuclei of economic activity assume a significant role in the national economy. The quality of airport infrastructure, which is a vital component of the overall transportation network, contributes directly to a country's international competitiveness and the flow of foreign investment. While cargo carried by air in India weighs less than 1% of the total cargo exported, it accounts for 35% of the total value of exports. Better cargo handling facilities lead to enhanced levels of importation, especially of capital goods and high-value items. Likewise, 97% of the country's foreign tourists arrive by air and tourism is the nation's second largest foreign exchange earner. Airports also represent a country's window on the world. Passengers form their first impressions about a nation from the state of its airports. They can be effectively used as symbols of national pride, if we pay sufficient attention to their quality and maintenance.

- 1 .In many remote, hilly and inaccessible areas of the country, air transport is the quickest and sometimes the only mode of travel available. This is especially true of sensitive regions on the borders with our neighbours in the west, north and north-east.
2. Airports need to be integrated with other modes of transport like Railways and Highways, enabling seamless transportation to all parts of the country.

Modernization and Up gradation of Airport Infrastructure

1. In keeping with the ICAO standards and recommended practices and the requirements of upgrading airports to the level of international and regional hubs, detailed master plans for the development of all selected airports will be prepared or revised by the operating agency. Such master plans should be conceived of and executed by the best expert advice available and taking futuristic requirements into account. All future up gradation and modernization will have to be normally done in accordance with the master plans. If there is a deviation from the master plan, it will be approved by the Board of Directors of the operating agency and the statutory Government agency designated for the purpose.
2. Priority will be accorded to safety, passenger facilities, aircraft and cargo handling, while deciding the allotment of funds among different up gradation and modernization schemes.
3. Air transport serves a time-sensitive market. The surface access to airports should, therefore, be efficient and city planners should keep the airport-linked requirements constantly in view while designing surface transport development plans. There is a special need to emphasize the aspect of rail links with airports, in view of its near absence in India as contrasted with other countries.
4. The helicopter provides a direct and rapid means of transport over short-haul routes and is, therefore, particularly attractive for businessmen. There is also a great potential for helicopter operations in off-shore oil exploration and production, movement of food grains and essential commodities in remote, hilly and inaccessible areas, traffic management in metropolitan cities and so on. A planned programme for building of heliports will be taken up to give a boost to the helicopter industry

9. Education and Training

With growing pace of industrialization in Punjab, the main stress has been on expansion, modernization and reorientation of Technical Education and Industrial Training system so as to match it with emerging technologies for ensuring quality manpower availability to the industrial sector. The basic objective is to produce Engineers, Technicians and Craftsmen who are welcomed as assets by the Industry of world class capability. For this purpose, besides opening up new Engineering colleges, Polytechnics and Industrial training in the emerging areas, the existing institutions are being modernized by providing new equipment and machinery with the assistance of World Bank as also the State Government. To consolidate the development in these fields, a full fledged 'Punjab Technical University' at Jalandhar has been established.

Punjab is ranked seventh in terms of education amongst the states

The Higher Education Department, Government of the Punjab provides education from Inter to Postgraduate level in various disciplines through 361 Colleges functioning in the eight divisions under the supervision and guidance of the Secretary Education, Government of the Punjab. The total includes 76 Inter, 218 Degree and 67 Postgraduate Institutions (Male/Female). The purpose is to not only enlighten the beneficiaries of the department i.e. the students but also to broaden their mental horizon in order to prepare them to cope up with the challenges of the 21st century's world. The Department envisions the society as

a society habitually capable of living with high ideals; tolerant of others' views and aspirations; a society which can co-exist with the changing times and assimilates the phenomenon of globalization of the world; a society which knows the joys of meaningful living; a society keen to protect its younger generation and leave behind a better world. We believe in equal opportunity for all in the quest for education and are striving to impart quality education of a standard recognized at the world community level. We recognize our duty to make quality education affordable for the common man and are striving to create an environment where education would lead to prosperity and improve the general standard of living for the masses.

STATE PROFILE OF PUNJAB Education

That Punjab, which ranks first in per capita income, is the tenth among Indian States in terms of literacy, is a socio-economic anomaly. Here is a case of incongruity between economic and social dimensions of development. In the 2001 Census, 70 per cent of Punjab's seven-plus population was recorded as literate as compared with 91 per cent in Kerala and 77 per cent in Himachal Pradesh. The all-India figure was 65 per cent.

A snapshot of education in Punjab is as follows:

- Practically every village in Punjab has a primary school, a middle school within 2 kms, a high school within 2.5 kms, and a senior secondary school within 7 kms, thus exceeding the norms set by the Government of India. Of the nearly 40 lakh school children, 80 per cent attend government schools, highlighting the contribution of government to the spread of education. No less than 78 per cent of the children, who join a school, drop out by the time they reach senior secondary level, and one-half of those who appear in the matriculation examination, as regular students, fail to pass. This is a colossal waste of educational effort on any count!
- The fast growing popularity of private English medium schools, more so in rural areas, puts a question mark on the quality of education provided by government schools.
- With six universities (two general, one technical, one medical, one veterinary, and one agricultural) and 287 colleges of all types, the state is well served by higher level educational and professional institutions. One-third of the colleges are located in rural areas. The number of graduate and post-graduate students approaches two lakh, with females exceeding males. Scheduled Caste students account for about one-tenth of all students in colleges/universities, whereas the Scheduled Caste population around one-third of the total.
- Government colleges account for only about one-fifth of the 223 general category colleges in the state. Most of the engineering colleges are run by the private sector, and medical colleges by government.
- As much as 99 per cent of the primary education budget goes towards disbursement of salaries. The corresponding figures are 90 per cent for secondary education, 71 per cent for college/university education, and 66 per cent for professional institutions. Paltry sums are left for infrastructural facilities.
- The state outlay on education was 7.2 per cent of the total under the Fourth Plan (1969-74). It declined to 2.9 per cent in the Ninth Plan (1997-2002). In an effort to redress the aggravating situation, the Tenth Plan (2002-2007) proposals provide an outlay of 6.1 per cent for education.

Improvement in the quality of school education, particularly in rural areas, is the most crucial item in the sphere of education in Punjab. The state is saturated, as far as the distribution of schools is concerned; it is the quality which is in short supply. The Punjab Education Policy 2000: Programme of Action indicates that the government is aware of the gravity of the existing situation. A variety of necessary proposals to strengthen the infrastructure, upgrade the quality of teachers, and improve management of school education has been listed. This augurs well for the reform of school education in Punjab.

We may, however, review here a moot suggestion made as part of the state's new education policy. While the decision to restructure the present four levels of school education (primary, middle, high and senior secondary) to two levels (elementary and secondary) is most welcome, the proposal to upgrade every primary school to elementary school does not appear feasible. The purpose of education would be better served if a policy of consolidation rather than of expansion, as at present, was followed. At the first stage, it would be advisable to upgrade only centrally located primary schools to the level of elementary schools, each of which is surrounded by three already existing primary schools. Only at a later stage, the decision about upgradation, or continuation, or closure of the remaining primary schools could be taken, in the light of the experience gained.

Under the new dispensation, it would be advisable if the elected bodies, that is, the village panchayats and nagarpalikas, were asked to regularly monitor the functioning of the schools. The policy document is silent on this issue. Mention has been made of the village- and town-level education development committees; absence of any reference to the elected local bodies is rather intriguing. In all fairness, involving the existing institutions is always better than creating new ones.

Punjab is no less happily placed in terms of the number of institutions of higher education, both general and professional. Again, while proximity is no issue, quality certainly is. Involved here are matters relating to infrastructural facilities, professional commitment of the teachers, and the desired culture of management. Faced with a severe resource crunch, the state government has recently been extending wide space for the entry of the private sector into higher education, more so in the professional field. To what extent is increasing privatization of higher education desirable and what will be its eventual outcome? This is not easy to predict. Should we assume that there is little room for reforming higher education and making it cost-effective within the public sector? In any case, management of privatization, particularly in higher education, is a serious obligation of the government. Equally important here is to understand that the quality of higher education and that of school education are interlinked. Teachers, of all disciplines and status, have to come through the channel of higher education and its quality is a function of the kind of students which school education produces. It is the 'quality of the teacher' which ultimately determines the quality of the entire system.

Advantages of Punjab in Human Resource

- 1. Easy Availability of unskilled labour**
- 2. High Productivity of skilled and unskilled labour**
- 3. Peaceful and disciplined labour are some of the outstanding features of human**

resources in Punjab. number of man-hours lost due to lockouts, strikes and disputes are lowest in Punjab. It is 1/3rd of UP, 1/4th of Haryana, less than half of Rajasthan. Punjab also offers peaceful and productive labour at the very reasonable cost.

- **Policy makers need to learn**
- **Reward teachers serving in backward areas**
- **Raise the standard of govt schools**
- **Make target-based plans**
- **Deal with rural-urban divide**
- **Spend more for quality education**
- **Hold teachers accountable**
- **Give real education, not mere literacy**
- **Synchronise education, infrastructure**

Vision 2020 For Education

- **To have a fully literate society where technology and innovation are a way of life.**
- **compulsory primary education to all.**
- **100% Literacy.**
- **100 % enrolment in Secondary/ Higher Secondary Schools**
- **0 % dropout rate from Secondary/ Higher Secondary Schools.**
- **Every village has at least one elementary school.**
- **Emphasis on science & technology, vocational & technical education.**
- **Private Sector Participation in education, particularly higher education.**
- **Access to poor & disadvantaged groups.**
- **Ensuring quality of education**

10. Science, Technology and Innovation

Biotechnology

Market Size

Growth in India's biotechnology sector has been dynamic. The industry grew by 39 per cent to reach a value of US\$ 705 million in the fiscal year 2003-04.

The biotechnology business in India has the potential to generate annual revenues of US\$ 5 billion and a million skilled

The Policy's objective is:

- **Attaining new heights in biotechnology research**
- **Harnessing biotechnological tools for economic development**
- **Scientific and technological empowerment of human resource**
- **Ensuring social justice especially for the welfare of rural population & weaker sections of the society.**

Punjab has also set up the Punjab Biotechnology Promotion Board (PBBP) and plans to develop infrastructure for R&D, data validation, commercialization and public awareness in the areas of biotechnology.

Leading biotech institutions in Punjab	
Organization	Strengths
Punjab State Council for Science & Technology (PSCST)	Policy, Planning, technology demonstration & transfer, Education and Awareness
Punjab Agricultural University (PAU)	Plant Tissue Culture & Transgenics
Guru Nanak Dev University (GNDU)	DNA Fingerprinting & Centre for Genetic Disorders
Thapar Institute of Engineering & Technology (TIET)	Agro/Food Processing
National Institute of Pharmaceutical Education & Research (NIPER)	Pharmaceuticals & Drug Development
Punjabi University (Pbi Univ.)	Human Resource Development
Panjab Technical University (PU)	Human Resource Development
Institute of Microbial Technology (IMTECH)	Microbial Biotechnology
Postgraduate Institute of Medical Education & Research (PGIMER)	Health Care Aspects

11. Health and Medical tourism

A healthy community in a society determines overall progress of the State. The Health & Family Welfare Department is committed to provide preventive, promotive and curative quality health Services at an affordable price to the people of the state. For this, a wide network of Health Institution consisting of hospitals, Community Health Centres, Primary Health Centres and Subsidiary Health Centres/Dispensaries to cater to the health needs of the rural and urban population through well trained medical and paramedical staff have been established in the State.

Aggarwal, an NRI settled in the US who has a cardiac problem is presently getting his treatment at Ludhiana's Dayanand Medical College, thanks to the high quality expertise of medical professionals, backed by the latest equipment and nursing facilities, and above all, the cost. **Varinder Singh, who has come from Holland** for treatment said, "the first obstacle abroad is that of language, how do you tell them about your problem. There is a communication gap. If a doctor is unable to understand the patient's problem how is he going to treat his patients? Facility comes next, as firstly, you need proper

communication". India has been a prime tourist destination for foreign tourists because of its rich flora and fauna, mountains, rivers and historical monuments. **Presently India has also come to be known as a place for getting good health care** facilities, whether it is hip

placement, brain surgery and even rejuvenation by traditional Indian medicines, and **Punjab occupies a special pride in this.** Dr Iqbal Singh Ahuja, one of the leading gynaecologists, who introduced the test-tube baby technology to northern India and has been successfully treating patients of infertility, said that the main reason that attracted patients to India was the emotional bondage the doctor developed with the patients. "I think in India what we offer, is sympathy which is lacking in foreign countries. They are more like machines. They will not like you to have any emotional relationship with the doctor. They are just professional! And when they come to India, we are giving emotional support

to the people who are coming for treatment for us," said Dr. Ahuja. And these sentiments are shared by the patients as well. As in industry and agriculture, Punjab today boasts of a world-class infrastructure for healthcare. The hospital was recently inaugurated to bring healthcare of international standards within the reach of every individual. **Like Apollo, many corporate groups like Escorts, CARE and the Hero Group have entered the healthcare business, making India a preferred medical destination.**

- **Satguru Pratap Singh Apollo Hospital: Satguru Pratap Singh Apollo hospital situated on the Delhi-Amritsar highway, is just a pearl in the ocean.** Jagdeep Singh, director at Satguru Pratap Singh Apollo Hospital said, "After all, the government is exiting from the healthcare business. They have no money to spend on healthcare business and all over the world the government are getting out of healthcare. It's coming into the private business. You don't see a new government hospital coming up. It is all private hospitals and private healthcare industry that will come to India. They have to come, but only thing we require from the government is that they give infrastructure status, subsidized land and electricity, and then we will be able to give our best to the people". A Bone Marrow Transplant in the US costs four times more than in India. Same is the case with Liver Transplant and Heart Surgery, which are much cheaper in India compared to developed nations like US, Canada and UK. Dr Kohli, medical superintendent, Dayanand Medical College and hospital said, "The facilities that we are now having, the gazettes and the health care that we are now having in our country is now matching the healthcare you find abroad. So people are now coming to India for treatment, which is what we call medical tourism. The reasons are, one they can visit their relatives, their home country, they have got facilities which are now at par with the West and the cost is definitely much less than what they are going to pay over there. Add to it, the waiting time in certain countries abroad where they have national health services procedures, which are so long that it is preferable to come down to their country, get your procedure done and get back". Healthcare is a booming business for the Indian corporate sector and it also contributes to the country's economy and infrastructure development. Even if Punjab's corporate hospitals are at par, if not better than the best hospitals in Thailand and Singapore, there is scope for improvement, and Punjab may become a preferred medical destination. And India is certainly giving thought to this given the fact that the Indian Healthcare Federation is working with tour operators to promote attractive packages for medical tourism

Western patients usually get a package deal that includes flights, transfers, hotels, treatment and often a post-operative vacation. This month Ujjal Dosanjh, the Canadian health minister met Panjab Chief Minister Amarinder Singh to talk about health tourism and cultural cooperation. "A number of non-resident Indians from Canada visit Panjab every year and the Chief Minister discussed the potential of medical tourism with their Health Minister. Punjab is upgrading its medical infrastructure and would soon have state-of-the-art facilities. WITH the increasing globalisation and shrinking borderlines, tourism is not the only budding industry. Now it is skills, techniques, technology and hope that crosses borders with individuals.

Aptly described as 'medical tourism', the trend of non-resident Indians visiting their homeland for specialised treatment as well as other benefits is fast catching up in the country with Ludhiana serving as an epicentre owing to its specialised medical services. According to doctors, the reason for a shift in preference to India in terms of medical benefits can be attributed to the fact that the expenditure incurred here for a specific treatment is almost one tenth of what it may cost overseas, especially since the expertise and the treatment meted out in India is of international standards. "I think the fact that the doctors have achieved the international level of competence and are capable of conducting specialised surgeries has attracted the patients here. According to the data, a bypass surgery in England may cost anywhere between Rs 8 to 10 lakh while in India it costs Rs 1.5 to 2 lakh. Similarly, an MRI test of brain costs approximately 750 pounds abroad as opposed to a mere Rs 3,000 here, which, the experts insist, is done with the same technique and methodology as abroad. According to Dr Mammen, the Urology Department in CMC on an average receives four to five NRI patients a month, usually for prostate operation, urological cancer, management of stone diseases and reconstruction purposes. He also mentioned that the patients hail mostly from Canada and the UK, as these countries house a major proportion of NRIs who otherwise belong to Punjab . The other reason cited by him for choosing Ludhiana over a treatment overseas by the patients being the long-waiting period usually given to them at the hospitals abroad. Dr Mammen had recently operated upon two NRIs based in Canada .

Dentistry is another branch of medical science that has many takers abroad owing to two reasons. Firstly owing to the high cost involved in a dental check-up as well as the fact that it is not covered under the health insurance scheme of the governments. According to Dr Vivek Sagar, dentist, who runs a clinic in the city and has been advocating the cause of medical tourism, apart from the specialised treatments, the overseas patients also come to get their regular dental check-ups done. "Not only is the cost one tenth but the fact that here we talk about the problem first and insurance later, makes it a more comfortable option as well," he said.

According to Dr Sandeep Puri, Medical Superintendent, DMC, though the hospital has been receiving calls from NRIs enquiring about the specialised services pertaining to dialysis and other specialised services, it is yet to execute its plans on medical tourism. "Though we have routine NRI patients complaining of medical problems encountered on their visit to the city, we are yet to put together the plans on medical tourism," he said.

For Hari Narayan Singh, an NRI based in Canada , who had come to the city to get treated for enlarged prostate and uterine stricture, a visit here has saved six months of pain and

burden of a due operation. “If I had not come to CMC, I would have had to wait for six months to get operated upon in Canada ,” he said. Similar is the experience of S.S. Grewal, also an Indian based in Canada , who is in the city to get treated for a cancerous growth.

India is getting medical tourists from over 55 countries for cardiac surgeries, multi organ transplants like Renal, Liver, Heart, Bone Marrow Transplants.

The Minister said that the Government has also set up expert committees for sorting out issues regarding medical insurance and further human resource development in the medical tourism industry. Tour operators have been advised to include Ayurveda health destinations in their marketing ventures in view of the increasing popularity of Ayurveda in western countries. The Ministry of Tourism has also produced brochures and CDs on medical tourism in India. **Quoting from the India Vision 2020 report, medical tourism could rival the IT sector within the next decade earning huge foreign exchange for the country.** Members of Parliament suggested facilitating development of healthcare centers in rural and hilly areas as they provide an ideal environment for treatment. They also suggested strict monitoring mechanism to avoid any malpractices. Members were of the view of that Indian system of medicines should be given priority in view of the increasing popularity of these systems globally. India will soon have more of health tourists as the government is issuing medical visas to promote the concept. **Medical tourism in the country was expected to grow by 40 per cent this year. Government is considering measures like fast track clearance for medical patients at the airport are in the offing in coordination with other ministries. He also mentioned development of appropriate health packages for traditional therapies like yoga, meditation, ayurveda and other traditional systems of medicine, which would not only attract high-end tourists from European and the Middle East countries but also give a boost within the country.** As per a Centrum report on medical tourism in India, the medical tourism industry in India is worth US\$ 333 million and as per the latest estimation an additional revenue of US\$ 2.2 billion is expected by 2012.

12. Natural Assets

PUNJAB has had a dismal record in conserving biodiversity. That the state may soon have international assistance in this task is, indeed, welcome. One of the most intensively farmed lands in the world, Punjab has also been increasingly urbanised. Today only 6 per cent of the land in Punjab is under notified forest cover. Even the designated 10 wildlife sanctuaries have not been looked after properly, and they face the onslaught of both urbanisation and farming, with reports of encroachments surfacing from time to time. As for wildlife, though hunting was banned in 1991, poaching goes on unabated. This week four poachers were held in Gurdaspur. They were hunting the monitor lizard, an endangered species. Earlier, poachers have been held at various places in Punjab and it is obvious that more endangered the species, the more allure it has. On the other hand, there have been problems associated with over-breeding of certain species like blue bulls and wild boar, which damage crops substantially in certain places. Wetlands are often sanctuaries for migratory birds. The Harike wetland has become a major wintering spot in India for the Greylag goose in the past few years. It needs to be developed for wildlife enthusiasts. There should be a balanced approach in allowing visitors to wetlands, zoos and parks, for generating awareness and revenue, without disturbing the ecological balance of

the area. It is hoped the experts will adopt a holistic approach that takes into account the alarming water pollution and depletion of groundwater, the poisoning of agricultural land due to the over-use of fertilizers and the preservation of the diverse native flora and fauna of the area, besides wildlife. Such an approach needs cooperation from local communities. Punjab has a rich cultural tradition of living in harmony with nature. This too has to be tapped in order to manage the natural resources of the state better

Natural Resource

The natural resource base of Punjab - land, water and vegetation - is under great stress. No less than 85 per cent of the state's geographical area is under cultivation, of which 94 per cent is irrigated. Cropping intensity is as high as 186.

Around 40 per cent of the land is said to be degraded in varying degrees. Included herein are the gully or ravine lands in the northeastern hilly and submontane region; soil-fertility depleted pockets in the central zone; water-logged tracts in the southwestern region; and marshy land along rivers and streams. Nearly 11 lakh tube wells (85% in the rural and 15% in urban areas) regularly suck underground water for irrigation, domestic, industrial and other uses. Nearly one-half of the development blocks (especially in the central zone where water table has gone down by five to ten metres during the last 25 years) report over-exploitation of subsoil water. Hardly three per cent of the total area is under actual forest cover. Such a situation is a sad commentary on what is happening in an agriculturally progressive state, dependent highly on soil and water. Added to all this is the fact that almost 70 per cent of Punjab is prone to floods.

The Government of Punjab is putting in considerable effort to redeem the situation. Watershed development projects have been undertaken in parts of the Kandi or submontane tract; wetlands are being raised on systematic lines in highly flood-prone areas; and water-logging is being tackled in all seriousness in the southwestern region. Depletion of underground water and fall in soil-fertility are worsening in the wheat-rice rotation region, which covers almost one-half of the state's total area. Diversification of the cropping pattern is certainly a remedy; the feasibility of developing tube well and canal irrigation, as complementary to each other in the same area, should also be explored. Flood-proneness of a large part of Punjab is paradoxical, but understandable, when one realizes that roads and canals at several places have been constructed against the grain of the land and thereby obstruct the natural flow of water. The drains, which are meant to flush out the rain-water, are often poorly maintained, get choked and cause floods. These drains should not only be cleared of any obstructive material on a regular basis, but also be provided with check dams placed across at a reasonable distance from each other. This will help in harvesting the rain-water, and thereby recharging the underground water.

Finally, to compensate for the gross inadequacy of forests in Punjab, agro-forestry and social forestry continue to be a viable proposition. Agro-forestry should be encouraged in flood-prone and water-logged areas; and social forestry on panchayat lands. Government should prefer plantation of sheesham over eucalyptus along roads. Since many saplings, planted by government agencies, get uprooted due to lack of proper care, it is essential to involve the local population in this task. Farmers, whose lands adjoin the plantation sites,

may be asked to provide necessary care. Strategies, of course, will vary in accordance with local conditions

Chapter-7

The Strategic Infrastructure Plan for Punjab

The plan:

- Covers all aspects of the State's infrastructure, including physical built assets and natural heritage.
- Identifies a range of opportunities for infrastructure development for the state.
- Sets out a new strategic approach for infrastructure decisions.
- Calls for a fresh approach to the way the government does business with the private sector.
- Flags new investment opportunities for the private sector.
- Will be used to guide new infrastructure investment by government and the private sector over the next 10 years to 20 years.
- Advocates a more collaborative approach both within and between governments for the management, maintenance and use of public infrastructure assets.

The strategic infrastructure plan of Punjab encompasses almost every facet of life in Punjab. It sets a pathway to a stronger economy and a more prosperous sustainable community. It embraces change and seeks to find ways to do things better – to create and seize new opportunities by focusing on six integrated objectives:

- Growing prosperity
- Improving well being
- Attaining sustainability
- Fostering creativity
- Building communities
- Expanding opportunity

Punjab must be well connected – through transport, information technology and communications – both nationally and globally. The availability of reliable and affordable energy and water supplies must be assured, as must access for all citizens of Punjab to education, health, housing and other social services. The state's cultural and heritage assets must be protected and its natural assets conserved.

Because infrastructure assets have long lives and are expensive, it is important to plan, finance, deliver, manage and use them as efficiently and effectively as possible. Modern infrastructure will underpin the state's progress by increasing its attractiveness and competitiveness as a place to do business and in which to live, work and to visit.

Strong economic growth without compromising the environment or quality of life is a key plank of the Strategic plan. Everything people of Punjab do must be sustainable– socially, environmentally and economically. In supporting this, the Strategic Infrastructure Plan sets out new long-term strategic approaches to infrastructure to be pursued by government, industry and the broader community.

The plan incorporates four broad strategies.

First, to **coordinate** infrastructure planning and construction across the state.

Second, to pursue more **efficient** and competitive infrastructure systems. This requires timely investment in new capacity that is affordable and fit-for-purpose. Assuring appropriate and timely maintenance of existing strategic assets is essential.

Third, to pursue and promote **sustainable** development through sound planning and use of infrastructure. Effective governance arrangements for asset management and associated service delivery are critical, and a full lifecycle approach to asset development, management and maintenance is essential. The state also needs to protect and conserve its natural assets and protect and sustain its critical infrastructure facilities.

Fourth, to meet future demands in a timely and **innovative** manner. This requires management of facilities across the state and greater use of information and communication technologies to improve access and lower the cost of delivering services. It involves exploring options for redevelopment and alternative uses for existing assets and design of adaptable multi-purpose facilities for shared use

Recommendations

1. The government should establish a State level Round Table for infrastructure involving all relevant public and private sector stakeholders, including consulting engineers, in developing a comprehensive State level Infrastructure Action Plan, and commit stable funding to implement the plan.

A State Level Roundtable on Infrastructure could assess existing infrastructure, make recommendations and develop a strategy for short and long-term investment decisions.

A national roundtable on infrastructure would address all of the infrastructure's critical needs of Punjab and provide the transparency and accountability required.

2. Government should invest in **Leading Edge Technology**. Investing in information management technology and an on-line resource to share technical information on the operation of infrastructure projects would meet the higher standards of openness and transparency demanded by investors and citizens.

3. Punjabi NRI Infrastructure Development Fund should be created

4. Punjab Power Fund should be created

5. Government must develop social infrastructure for developing human resources

6. Government must set up an accreditation board to standardize the services of private and government health sector for medical tourism.

7. Education infrastructures should be given top priority.

8. Road sector needs a lot of further improvement.

9. Expand schemes with beneficiaries' participation for Public Private Partnership (PPP) Projects

10. Allow commercial exploitation of land other than along the right of way

11. Create a road fund

12. Toll existing road network

13. Draw up a state water account

14. A key role of the IPCSI (Infrastructure Division) is to identify infrastructure related projects and facilitate the timely delivery of the State's priority infrastructure projects. This is achieved by working closely with State Government agencies, other spheres of government, NRI investors and the corporate houses.

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