EXECUTIVE SUMMARY

Comprehensive Development Plan of Economic Corridor

Consultancy Services for Preparation of Development Plan for Pithampur-Dhar-Mhow Investment Region of Madhya Pradesh sub-region of DMIC

CONTENTS

1. ECONOMIC CORRIDOR

1.1. INTRODUCTION

1. Economic Corridor is one of the four Early Bird Projects proposed as part of development of Pithampur-Dhar-Mhow Investment Region in the Madhya Pradesh Sub-Region of Delhi Mumbai Industrial Corridor (DMIC).

2. The proposed Economic Corridor, from Indore Airport to Pithampur Industrial Area (PIA), is anticipated as an economic growth axis and a transport link connecting the influence area of city of Indore and Industrial Area of Pithampur. Due to increasing industrial and business activities in this region, there is a need to tap potential of the region to promote planned development for non-polluting industries, business, skill development and knowledge centres, residential, recreational and social infrastructure.

3. The proposed economic corridor is approximately 20.3 km (as per the chosen final alignment) in length and it is proposed that 300m area on either side of the corridor would be developed as part of the project. Figure 1 presents the selected alignment of Economic Corridor.

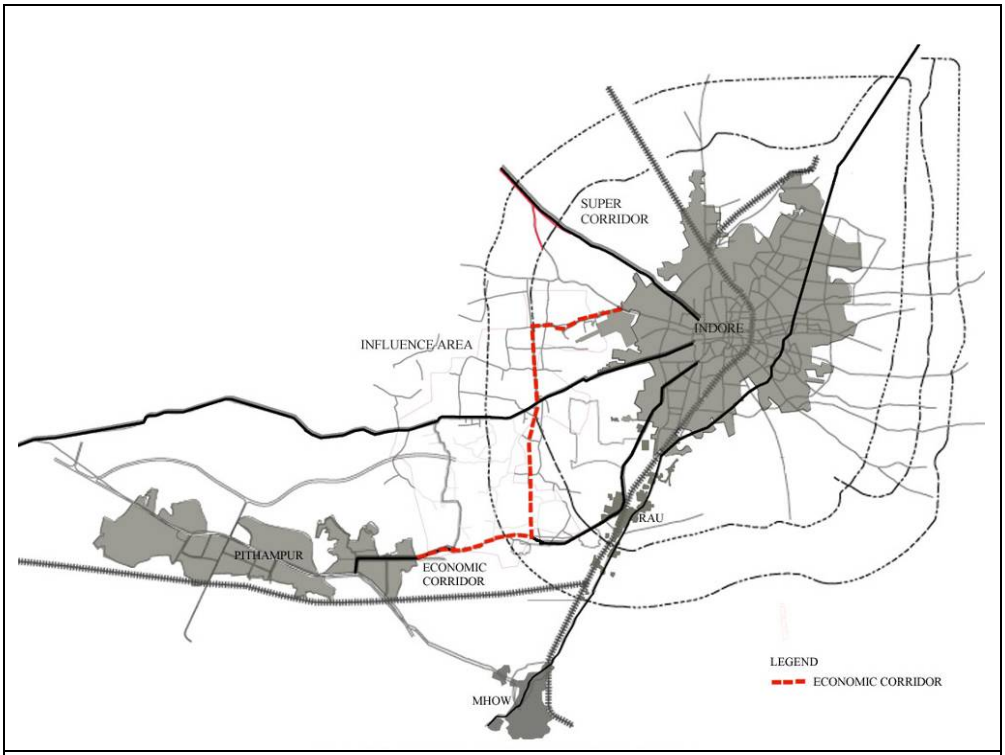


Figure 1 : Selected Alignment of the Economic Corridor

1.2. PROJECT CORRIDOR AREA- EXISTING SITUATION ASSESSMENT

4. Economic Corridor traverses through predominately flat terrain except the presence of small hillocks rising about 20-25 meters from normal ground level. Main natural feature in the immediate Influence area is River Gambhir which runs south to north. Project area thus has a network of smaller natural drains running east to west at regular interval.

5. The proposed economic corridor traverses through Indore, Mhow & Depalpur Tehsils of Indore District and Dhar Tehsil of Dhar District. The corridor would have a direct impact on 17 villages, which fall in Indore (11), Depalpur (2), Mhow (3) and Dhar (1) tehsils respectively.

6. Three sections of the corridor show distinct land use characteristics. Section I, from Airport to NH-59, is dotted with big institutional properties, like Bijasan Temple, Hinkar Giri Tirth Temple and College, Shri Jain Shwetamber Professional Academy. The section also contains a few up-coming housing complexes being developed by Emmar MGF Township, Vajpayee Group Housing etc. Within this section, the project corridor runs through Village Kordia Barda and takes a left turn near the Police Post. The stretch between the Police Post and the NH-59 is flanked by agricultural fields on both the sides. Section II of the Corridor, from NH-59 to Rau-Pithampur road again passes through predominately agricultural land. Two villages falling in this stretch are Sindoda and Shri Ram Talawali. Intersection of this section at Rau-Pithampur road is marked by STI and one educational institute, namely Lord Krishna College of Technology. Section III, along Rau-Pithampur Road, has only one village settlement of Bheslay. This section also crosses river Gambhir and ends at the GAIL sub-station at the start of Pithampur Industrial Area.

7. As part of the traffic surveys, Traffic Volume Counts (TVCs) are conducted for 3 days and 24 hours at the Indore Airport end and1 day at ICD Dhannad. Apart from this, TVCs and Road Side ODs are also conducted at 6 locations on the Outer Cordon and One location in Inner Cordon of Pithampur Industrial Area (PIA). From the traffic data analysis it is observed that 2,649 vehicles per day are moving between Pithampur and Indore through the existing airport road. Similarly, 12,266 vehicles per day are moving between Pithampur and Indore through the existing Rau road. OD analysis shows that on an average 53,979 passenger trips are moving between Pithampur and Indore, 1,395 trips are moving between Pithampur and Ujjain, 51,427 trips are moving between Dhar and Indore and 3,674 trips are moving between Dhar and Ujjain.

8. About 10% of land falling within 300 meter development zone of Economic Corridor belongs to Government. Detail analysis of villages with regard to type of government land shows that only grazing land is available for the purpose of development and it is about 60 ha.

9. About 910 ha of land is available for development within the 300 m belt of Economic Corridor. Refer Table 1 for availability of total developable land along the corridor. In assessing the total land availability following land uses and activities has been eliminated owing to certain special characteristics and implications.

- Existing Village settlement
- Regional Drainage Network
- Existing Roads.
- Proposed projects like Airport Expansion, NH-59 widening and ongoing residential developments have also been expelled from the total area calculations.
- As per the AAI guidelines, areas falling in the conical 3-dimensional surface measured with regard to air-strip have also been excluded from the area assessments.

Table 1: Potential Areas for Development

Section	Developable Land available within 300 m (Ha)
Section I	321.2
Section II	394.1
Section III	194.4
Total	909.7

10. Apart from the site related aspects, other regional development and upcoming projects have bearing on the development of Economic Corridor as discussed below:

- Indore BRTS Network: Indore BRTS plan is under implementation and a Terminal is proposed near the Airport. Extension of BRTS from the Proposed Terminal at the end of Super Corridor to Pithampur along Economic Corridor is an important aspect for connecting Indore and Pithampur by a public transport link.
- Indore Master Plan 2021: Some portion of the Economic Corridor is part of Indore Master Plan 2021 and use of applicable development regulations of Indore Master Plan for activities proposed along Economic Corridor is a logical option.

- Integration of Super Corridor: Higher order city level commercial and institutional facilities along Economic Corridor are required for functional integration of Economic Corridor with Super Corridor and positioning the Corridor as a regional artery.
- Investment Region and Green-Field Township: Economic Corridor has the potential of becoming a Flagship Project for the proposed Green-field Township with nodal development at the intersection of major Investment Region roads.

1.3. DEMAND ASSESSMENT

11. The Market Potential and Demand Assessment for Economic Corridor have been carried out under five broad aspects. The indicators for establishing the market potential are comprehensively chosen to place role of Economic Corridor in the context of it being a link between Pithampur Industrial Area and Indore City, a flagship project for Pithampur-Dhar-Mhow Investment Region, and a potential Economic and Industrial Infrastructure resource center for the immediate influence area of the IR. The parameters for Market Potential and Demand Assessment are as follows

- Development and Growth Trends in Influence Region
- Investment Climate
- Market Potential Surveys and Target Group Consultation
- Benchmarking Studies
- Site Assessment Led Potential

12. Based on the study of above aspects, SWOT analysis for Economic Corridor has been carried out as presented in Table 2.

Table 2: SWOT ANALYSIS

Strengths	Opportunities
• Green-field Site, hence very high possibility of imageable development • Presence of Airport and Pithampur Industrial Area in vicinity • Presence of important road links like NH-59, Rau-Pithampur Road and Mhow-Pithampur Road, which provide crucial connectivity with other areas • Strong Business and Industrial base in Influence Region and the emerging urban belt along Rau-Pithampur road • Availability of potentially developable land parcels • Extension of Upcoming Super Corridor	• Proposed road projects connecting the area with larger region in the Development Plan • Investor-friendly Industrial and IT policy • Upcoming mega projects in the influence zone • Interdependency between Indore and Pithampur and gradually increasing demands of the large commuter population between Pithampur and Indore • Potential Location of MMLH and Investment Region • Growing demand for Services and established history of trade and commerce of Indore • Potential Integration with Urban Nodes in the Region like Rau, Dewas and Ujjain • Central Location of Indore-Pithampur in India for Logistics Infrastructure Development • DMIC as a mean to leverage support infrastructure for industrial growth in the region • Emergence of Knowledge Hub in the form of Indore-Ujjain region for ample human resource availability and hence requirement for creation of job opportunities. • Inadequate availability of water can foster development of less-water consuming industries like IT/ ITes, Service sector etc.
Weakness	**Threats**
• Lack of existing support and infrastructure facilities • Located in under-developed western part of Indore city • Presence of existing villages within the corridor • Lack of direct connectivity with the main city of Indore • Absence of large parcel under government holding	• Resistance for Land acquisition • Inadequate Water and Power Supply • Competition from other parts of the city- NH3-Bypass and Super Corridor • Competition from other Investment nodes in DMIC

13. Based on the demand assessment, some the primary activities that have been identified for the Economic Corridor are summarized below

- Service Sector-IT/ITeS,
- Integrated Residential Townships,
- Business and Leisure Tourism activities,

- Logistics and Warehouse
- Non-polluting engineering industries.

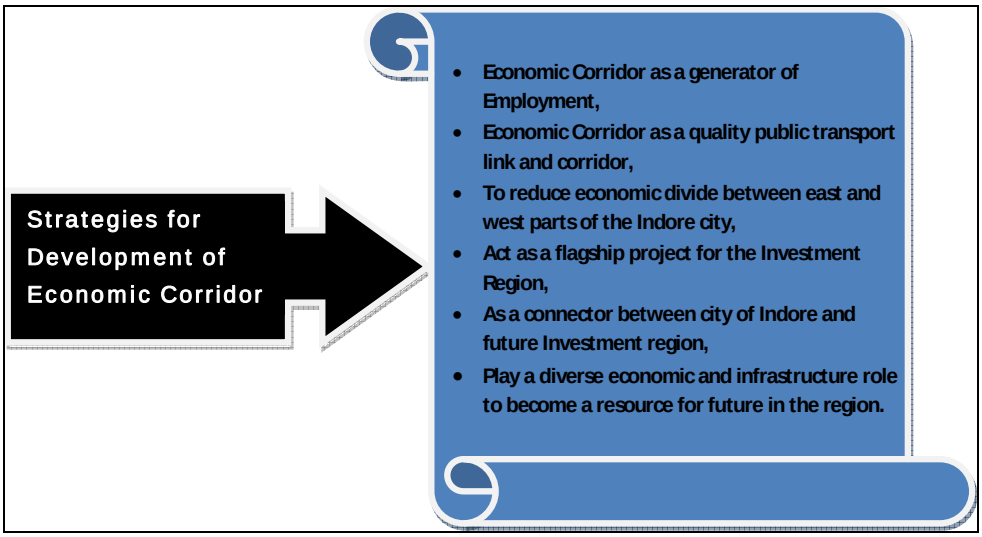
14. Apart from the above listed activities, certain support activities that clearly emerge as a result of the comprehensive analysis are:

- Commercial activities- shopping malls, multiplex, Hotels etc
- Support business facilities to industries and Hotels.
- Social facilities like Medical Hub and Education Cluster
- Recreational and Entertainment spaces.

1.4. COMPREHENSIVE DEVELOPMENT PLAN

15. The primary intent of the Economic Corridor is to attract economic activities and growth which will spur regional economic development, especially in the light of Madhya Pradesh Sub-region of DMIC. It is envisaged to create an Economic Corridor which is a major generator of employment, multi product in its economic base, infrastructure led development, and which can help in re-visioning the associated region. The corridor can carry the seed of promoting Indore and Pithampur region from being branded as Tier III city to Tier II city in the country having an international image. Figure 2 provides significant strategies for development of the Economic Corridor.

Figure 2: Strategies for Development of Economic Corridor



16. In principle, the main components of the economic base of the corridor are IT/ITES industries, Business Infrastructure, Institutions and R&D Centres, Tourism and Recreational facilities, Residential, and Non-polluting Industries. A brief highlight of the proposed economic base of the project is given below.

- The multi products/ activitys which can form part of the corridor to determine its economic base are IT/ITes, Tourism and Recreational Industry as gateway to the region, Fashion Industry for value addition to Textile Industry, Health Infrastructure, and other Non-Polluting Manufacturing Industries for value addition to the industrial profile of the region.
- Education and R&D infrastructure would be developed for supporting the above mentioned clusters or economic activities.
- Development of essential support residential and social infrastructure in order to create a sense of secure environment even during the late hours of the day.
- Provision of business and commercial infrastructure that would promote and market industries and other value addition industries.
- Laying of quality public transport and road infrastructure for providing connectivity to the corridor which would be instrumental in achieving economic success of the corridor.
- Provision of sustainable water, power and energy, waste management infrastructure to support the main economic base.

- It is also imagined that the economic corridor can become an economic base for the region as a whole, if it is well connected, and not just promoted as a link between Indore Airport and Pithampur Industrial Area.

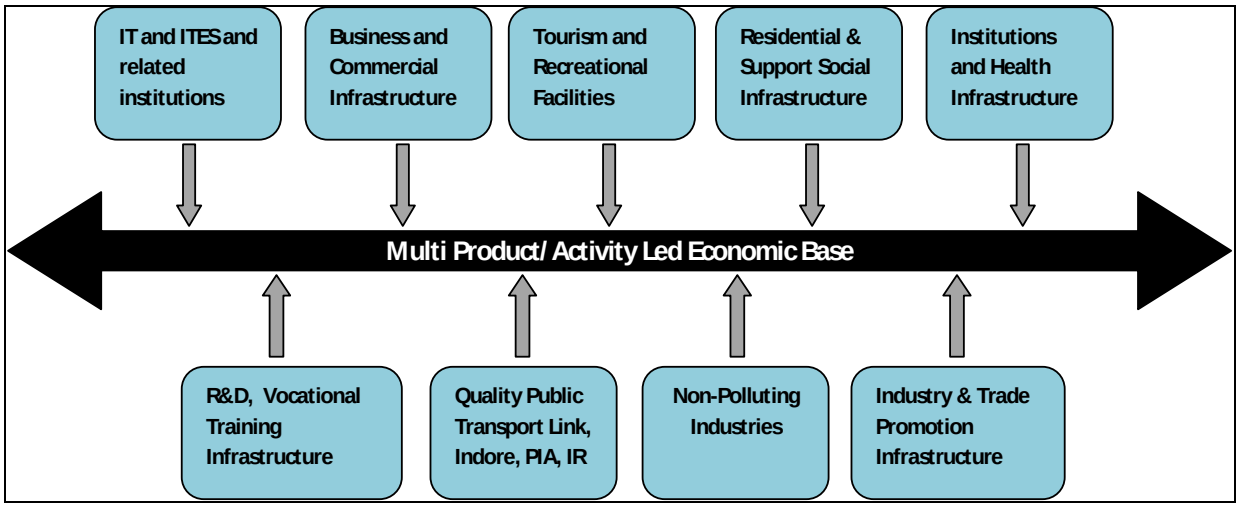


Figure 3: Main Components of Economic Base of the Corridor which is likely to act as a regional economic infrastructure resource.

1.4.1. Disposition of Activities

The market studies, stakeholder consultations and benchmarking studies conducted for the project, have duly ascertained that a multi-product or cluster based approach for the corridor would be more viable. Thus, the urban form and structure of the Corridor have been defined by cluster or nodal developments that impart a distinct image to the three sections of the Corridor. As part of Comprehensive Master Plan, disposition of these activities has been carried out in the form of 9 broad activity clusters, as illustrated in Figure 6 .

Section I: From Airport to NH-59 Intersection

This particular section of Economic Corridor lies close to Airport and rest of Indore city. NH-59 also provides a good connectivity to this area. Further the Development Plan-2021 also proposes termination of Super Corridor near the Airport. Four activity clusters are proposed in this section of the Economic Corridor:

a. *Terminal Cluster:* This activity cluster is planned keeping into consideration the BRTS Terminal proposed near the Airport. As per Indore BRTS Plan, two bus corridors, Ujjain Road to Airport and Airport Road to River Corridor, are terminating at this terminal. As part of the Comprehensive Development Plan, it is envisage that BRT system can be extended from this terminal to Pithampur and proposed Investment Region along Economic Corridor, thus making this cluster as an inter-change point between the three BRT routes. Keeping the inter-change benefit of this location, it is proposed to develop this cluster as an integrated terminal station with Support facilities, Offices and Commercial spaces.

b. *IT/ITeS Cluster:* This cluster is planned along the section starting from BRT terminal upto the Airport Approach Funnel. Main considerations for the location of this cluster are:

- Proximity to Indore City and availability of potential skilled human resource

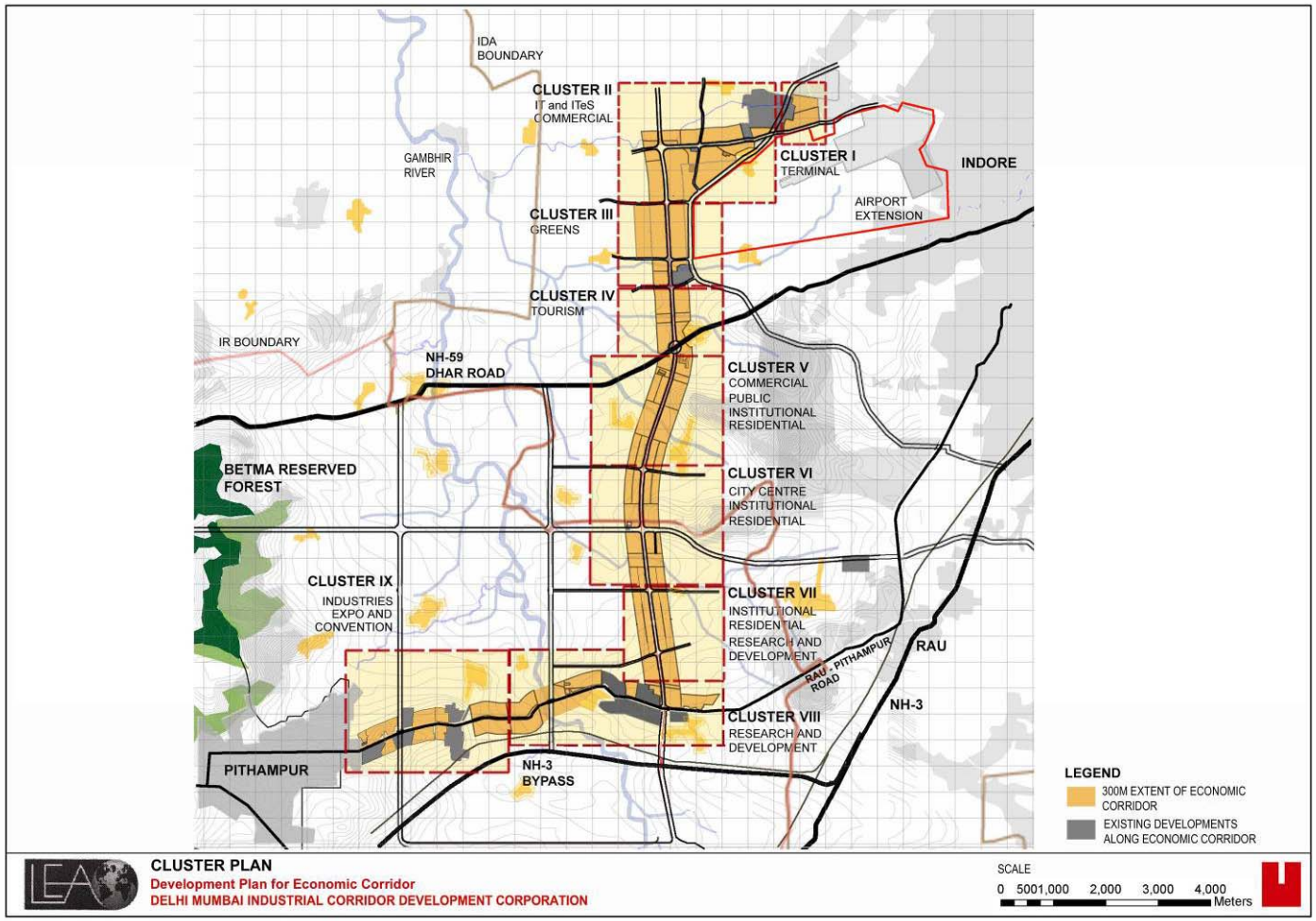


Figure 4: Cluster Disposition along Economic Corridor

- Proximity to BRT Terminal for convenience of potential work-force
- Proximity to Indore Airport which is under expansion and thus likely to connect with other cities in India with more aircraft movement
- Provision in the IT Policy for promoting IT industry near airports of the State and possibility of drawing the resultant benefits
- Nodal Development at the intersection of Super Corridor and Economic Corridor and future employment areas for Western region of Indore
- As part of this cluster, IT/ITeS related space and other support commercial and residential spaces have been proposed.

c. *Recreational Cluster:* This cluster has been proposed in the influence zone of the airport approach funnel, primarily owing to the restrictions in the building height. The location selected for the cluster also takes cognizance of the Indore Master Plan-2021, wherein similar land use has been proposed. Further, this cluster has been proposed to cater to IT/ITeS cluster in north and Tourism cluster in south with complimentary functions like Clubs, entertainment parks, Golf Courses etc.

d. *Tourism Cluster:* Tourism cluster has been conceived near the intersection of Economic Corridor with NH-59. Major considerations for this location are:

- Proximity to NH-59 connecting tourism destinations like Mandu towards west and Maheswar, Omkareshwar towards South via NH-3.
- Accessibility to Ujjain via Super Corridor
- Proximity to Indore Airport
- Proximity to IT/ITeS cluster having potential of generating Business Tourism facilities.
- Indore as a leisure and business tourism centre, identified in the Tourism Policy of the State and resultant benefits

As Indore lies in the centre of Heritage-Religious triangle comprising of places like Ujjain, Maheswar, Mandu and Omkareshwar, improved accessibility with the development of road infrastructure (Super Corridor, Economic Corridor, Nh-3 bypass and NH-59) provides an opportunity to integrate tourism facilities in the immediate vicinity of airport at this location. The tourism cluster is thus conceived as an integrated node comprising of Star Hotels, Budget Hotels, tourism centres, shopping etc.

Section II: NH-59 to Rau-Pithampur Road

This section of Economic Corridor connects NH-59 with Rau-Pithampur Road and runs through the Green-field Township proposed as part of Concept Plan of Investment Region. The section is envisaged as a major urban corridor for the proposed Township, with creation of commercial nodes at important road intersections and institutional/ residential conurbations between these nodes, thus resulting in three mixed use clusters.

a. *Mixed Use Cluster 1:* This cluster is planned from the intersection of NH-59 to village Sindoda. At the intersection of NH-59 a commercial node has been proposed to consolidate tourism cluster. Land parcels fronting the Economic Corridor are proposed as an institutional belt along with Public functions. A second layer of residential has been proposed behind institutional belt in order to integrate the development along Economic Corridor with residential township sectors. Along the natural lines green belts are proposed to segregate incompatible uses.

b. *Mixed Use Cluster 2:* This cluster is proposed at the intersection of IR-Central Artery with Economic Corridor. This intersection has been proposed as a main city level commercial node for Green Field Township and along either side of this node institutional and residential linear development is proposed.

c. *Mixed Use Cluster 3:* This cluster is proposed near the intersection of Rau-Pithampur road. Treatment of this cluster is quite similar to the mixed use cluster 2, wherein a linear institutional and residential treatment has been proposed for the developable land along Economic Corridor.

Section III: Along Rau-Pithampur Road

This section is characterized by existing industries, educational institutions and warehouses. Existing urban development is being consolidated in the form of two clusters along this section of Economic Corridor.

a. *R&D and Industrial Cluster:* This cluster is located between the STI intersection and River Gambhir. Along the Rau Pithampur Road, lot of new colleges have recently come up after the establishment of IIM Indore and as part of Comprehensive Plan, it is proposed to consolidate the R&D functions till village Bhesley. Remaining part of the section is proposed as non-polluting industrial belt in the context of Pithampur Industrial Area.
b. *Industrial and Expo Cluster:* This cluster is closest to Pithampur Industrial Area and already exhibits some industrial activity. Non-polluting industrial activity is proposed in this cluster. An Exhibition and Trade Promotion Centre is also proposed to mark the entry of Pithampur Industrial Area. The Centre is being conceived to house exhibition spaces, business support functions and hotels, which would give an impetus to the industrial growth of the region.

17. Table 3 provides land use distribution of Economic Corridor and Figure 6 shows the proposed land use.

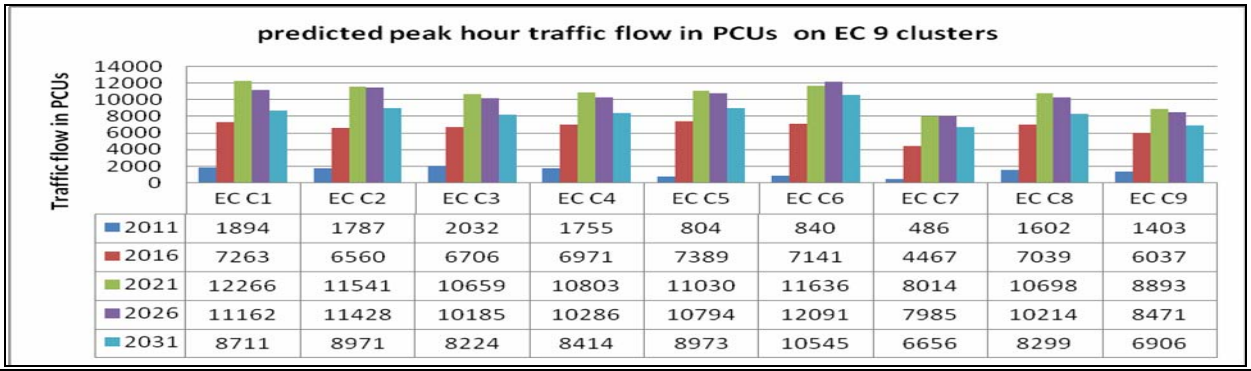
Table 3: Proposed Land Use Break-up of Economic Corridor

LANDUSE	LAND AREA *(in Hectares)*	Land Area *(% age)*	Built Up Area *(in million sqm)*
Commercial(City Centre, Sub-City Centre)	96.16	8.3	1.41
Residential	93.26	8.0	1.25
IT And ITeS	152.55	13.1	1.56
IT- Residential	16.95	1.5	0.29
Tourism (Hotels, Amusement Parks, Theme Parks Etc)	52.72	4.5	0.50
Institutional (State Govt Offices, Training Institutes Etc)	91.09	7.8	0.89
R&D	54.24	4.7	0.53
Non Polluting Industries	159.2	13.7	0.84
Exhibition And Trade	38.3	3.3	0.38
Public Facilities (Educational, Health, Utilities)	16.07	1.4	0.11
Terminal Facilities (BRT Terminal+ Commercial)	31.9	2.7	0.50
Greens (Entertainment, Regional Park, Golf Course Etc.)	222.02	19.1	0.16
Roads	138.82	11.9	0.00
TOTAL	1164.2	100.0	8.41

1.4.2. Transportation Infrastructure and Road Design

18. The total traffic demand assessment of the Economic Corridor has been carried out with regard to the activities proposed along the Corridor and surrounding land uses. Based on the traffic projections and existing situation analysis, road design has been proposed.

The Figure 5 shows that the peak hour traffic flow in PCUs. From the analysis it is observed that the peak hour traffic flow in PCUs 1894 at EC C1, 7389 at EC C5, 12,226 at EC C1, 12091 at EC C6 and 10545 at EC C6 for the years 2011,2016,2021,2026 &2031 respectively.



	EC C1	EC C2	EC C3	EC C4	EC C5	EC C6	EC C7	EC C8	EC C9
2011	1894	1787	2032	1755	804	840	486	1602	1403
2016	7263	6560	6706	6971	7389	7141	4467	7039	6037
2021	12266	11541	10659	10803	11030	11636	8014	10698	8893
2026	11162	11428	10185	10286	10794	12091	7985	10214	8471
2031	8711	8971	8224	8414	8973	10545	6656	8299	6906

Figure 5:Peak hour traffic flow on 9 clusters in PCUs

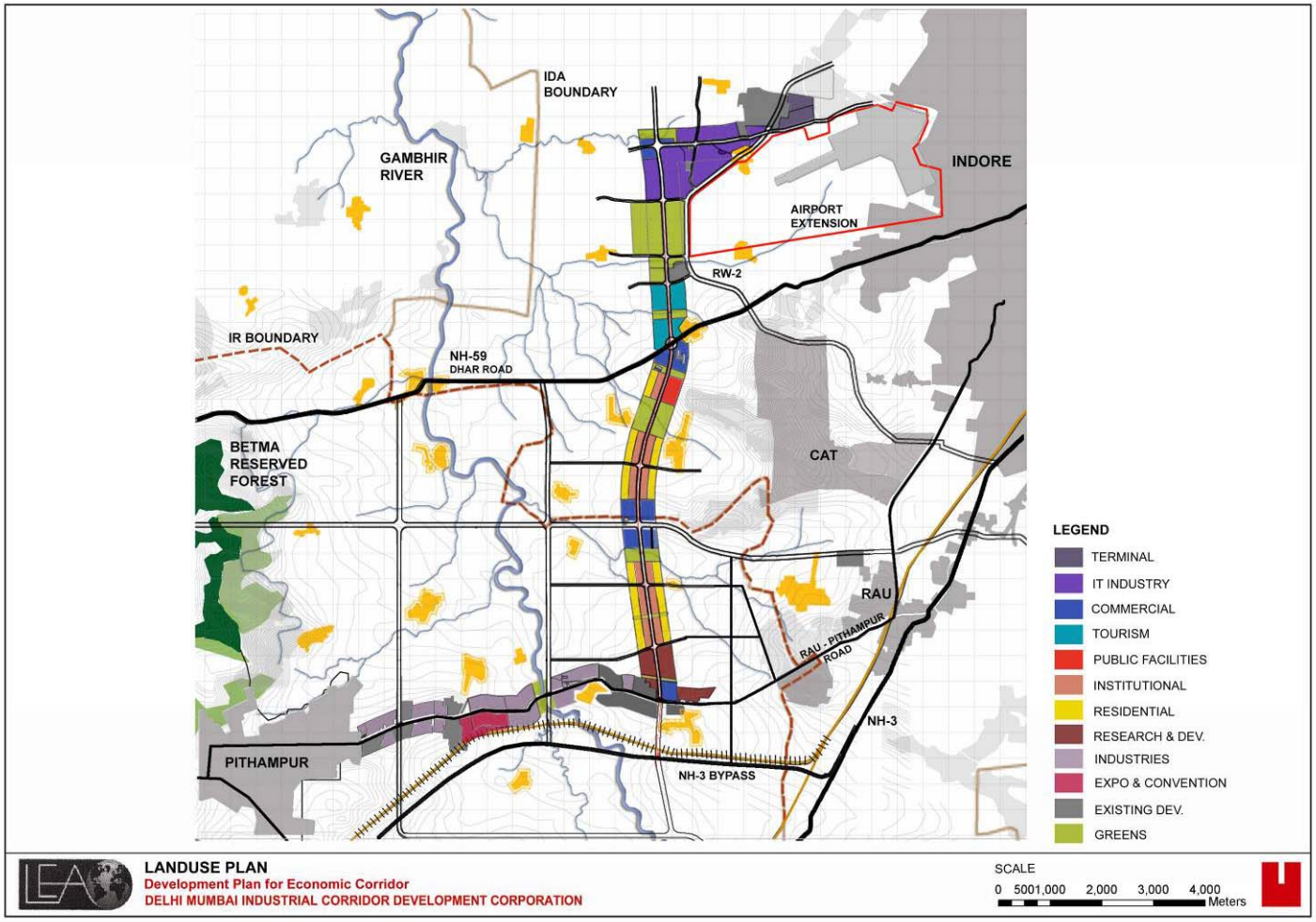


Figure 6: Proposed Land Use Distribution

19. Table 4 shows the number of traffic lanes required for economic corridor for the period from 2011 to 2031.

Table 4: Traffic Lane Requirement for Economic Corridor

Section 1 and 2					
	2011	2016	2021	2026	2031
Service Road	0	0	2X2	2X2	2X2
Main Carriageway	4	4	4	6	6
Public Transport	0	0	2	2	2
Section 3					
	2011	2016	2021	2026	2031
Main Carriageway	4	4	6	6	6

20. After Engineering surveys and road investigations, following strategies and design features have been adopted for the road design of the Economic Corridor:

- Cross-Sectional Elements: The proposed right of way is 75 m from start of Section I and end of Section II. Existing right of way along Section III is 30 m and is adopted full. The carriageway width for mixed traffic adopted as 7 m with 0.25m kerb shyness. The carriageway width of service roads adopted is 6.25m on both sides all along the section I and II. Central width of 7.5 m has been provided for dedicated bus lane. The width of paved shoulder is 1.5m and adopted separator width is 2 m on 75 m RoW cross section and 2 m median is provided on 30m RoW cross-section.

- Alignment Design: A digital terrain model for the alignment has been generated and designed centre line is followed to widen the existing road concentrically to four lane along with dedicated bus lanes in the centre and service roads on either sides for first two sections and six lane divided road with central median of 2m for third section. Minor changes have been made in order to straighten the alignment as far as possible. The corridor has few curves which are designed for 50-60 kmph speed. The vertical levels for existing sections of the corridor are maintained same as existing and the levels of the green-field alignment is raised on an average to 1m above the ground level.

- Design of Junctions: The geometric design of junctions have been done taking into account the site conditions, turning movement characteristics, level of services, overall economy and operational safety. There are 5 major and 9 minor junctions across the project road.

- Pavement Design: It is evident from visual inspection and pavement surveys that pavement has deteriorated extensively and roughness of the pavement is also high. It is proposed to dismantle the existing pavement completely and provide a new pavement with concentric widening in Section I. In section III, the pavement is considerable better but approximately central half of the pavement will be required to construct the central verge. On both sides of the proposed median about 2m wide strip of pavement will be available which can become part of the proposed carriageway but from technical consideration it is not advisable to make use of such narrow strip. Thus, it is proposed to dismantle the existing pavement and provide new pavement on both sides of the median.

- Ground Improvement: The soil all the along the corridor is predominately black cotton soil with highly clay and silt content. It is recommended that a ground improvement is essentially carried out for entire corridor. The ground improvement is proposed at this stage with replacement of 200mm existing soil below 500mm sub-grade. Bottom of 200mm ground improvement layer is provided with geo-grid reinforcement on well compacted base. Above such geo-grid reinforcement, the 200mm compacted layer has been proposed with granular fill/sand on ground improvement layer to receive 500mm select earth-grade.

1.5. PROJECT COST AND IMPLEMENTION

1.5.1. Project Costing

21. At this stage, Government of Madhya Pradesh has recommended to go ahead with following implementation strategies:

- Land Acquisition for 75 M RoW of the economic corridor- Rs. 230 Million for private land acquisition of about 85.75 Ha.
- Four Lane road construction in the immediate phase – Rs. 1400 Million for entire 20.3 Km of the Economic Corridor
- Change of Land Use in Indore Master Plan 2021 with regard to proposed activities along the Corrridor and thus envisaging the development of the activities by private investors. Development Charges in the tune of 1250-1500 Million is expected to be recovered through private developers.