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LOW-CARBON COMPREHENSIVE MOBILITY PLAN FOR UDAIPUR:

SUSTAINABLE MOBILITY WITH LOWER EMISSIONS

AN UPDATE ON THE 'PROMOTING LOW-CARBON TRANSPORT IN INDIA' PROJECT, IMPLEMENTED IN VISHAKAPATNAM, RAJKOT AND UDAIPUR.

UPDATE ON UDAIPUR CITY.

ABOUT THE CITY

Udaipur, the City of Lakes, is the administrative headquarters of the Udaipur district in the state of Rajasthan. It is one of India's most famous tourist destinations, drawing both domestic and foreign tourists. Once the capital of the 16th-century Mewar kingdom, Udaipur has inherited a profusion of historical and cultural riches from its glorious past. A dominant force in the region since the mid-1500s, the city is renowned for its Rajput-era palaces and picturesque lakes, including Pichola Lake, Fateh Sagar, Udai Sagar and Swaroop Sagar.

An active participant in UNEP's Promoting Low Carbon Transport in India project, Udaipur has been selected as a case study for preparing Low-carbon Comprehensive Mobility Plans (LCMPs). The study area covers about 347.91 sq. km (34,791 ha) and a population of 637,717 (2011 census). As per the Master Plan (2001), 37.42% of land in Udaipur's Urban Control Area is allocated for residential use, 18.8 % for transportation, 12.3% for public and semi-public use, 10.5% for industrial use, 3.82% for commercial use, 25.41% for recreational use and 1.2% for governmental needs. Figure 1 shows the study area for the LCMP.

CITY VISION

Udaipur's vision for urban mobility is to provide safe, efficient and environmentally sustainable means of transportation in order to improve mobility and accessibility for people of all genders and socioeconomic groups.

For more information on the project, access the project website at www.unep.org/transport/lowcarbon

PROJECT PARTNERS:

IIT Delhi

AHMEDABAD

CEPT UNIVERSITY

CURRENT SITUATION AND KEY CHALLENGES

As the study results show, Udaipur is a typical medium-sized Indian city with its share of inherited problems. Among other transport-related challenges, the city lacks an organised public transport system and Non Motorised Transport (NMT) infrastructure. Only 3% of all trips in Udaipur are made using public transport, whereas private vehicles (including both four-wheelers and two-wheelers) are used for 51% of total trips. Footpaths are found on only 4% of the road network, compelling pedestrians to compete with motorized vehicles for road space. As a result, NMT users are increasingly vulnerable: according to the study, 50% of accident victims are NMT users. The rising number of vehicles running on fossil fuels has also resulted in increased concentrations of noxious gases in the urban atmosphere. Motorized vehicles add 33,218 tonnes of nitrogen oxides (NO_X), 374 tonnes of SO_2, 25 million tonnes of CO_2 and 10,731 tonnes of PM_{10} to Udaipur's air every year.

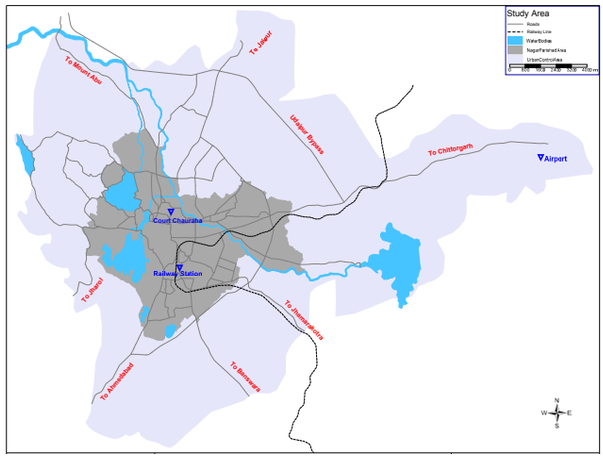

Figure 1: Udaipur Urban Control Area (Study Area for LCMP)

BUSINESS AS USUAL SCENARIO

The Business as Usual (BAU) scenario assumes the continuation of current trends. Therefore, the projects drafted by Udaipur's local authorities (UIT, state government, etc.) as per the revised Master Plan for 2031 are taken into consideration. The scenario considers an increase in population in line with projections in UN Guidebook, decreasing size of households and improvements in vehicle efficiencies.

SUSTAINABLE URBAN TRANSPORT SCENARIO

Under this scenario, a sustainable urban transport system would be established through a combination of interventions under four broad categories:

URBAN DESIGN–LAND USE INTERVENTIONS

A mixed land use approach has been proposed on available land. It is also suggested that the residential density along the public transport corridors, should be three times of the existing city gross density. NMT-friendly neighbourhoods are created to increase mobility across the social spectrum and decrease the need for private motorized vehicles.

NMT INTERVENTIONS

A wide range of NMT measures are envisioned, including adding more footpaths and improving existing ones; placing pedestrian crossing signals at all important intersections; and developing cycle lanes. The introduction of a bicycle sharing scheme and bicycle parking lots at transport terminals are also part of this scenario, as are road markings, signage and street lighting, as well as the development of a heritage walk along major heritage sites. An overall improvement of road geometry so it is conducive to NMT use is also envisaged.

PUBLIC TRANSPORT INTERVENTIONS

Under the Public Transport Interventions, strengthening of Intermediate Public Transport (IPT) system through introduction of organized IPT followed by a gradual phase wise development of Public Transport System to match the increasing travel demand, has been suggested.

VEHICLE TECHNOLOGY INTERVENTIONS

The vehicle technologies are expected to be more efficient than the BAU and kept consistent with national average projections available from UNEP Guidebook.

TABLE 1 SHOWS UDAIPUR'S CURRENT SITUATION, BAU SCENARIO, AND SUSTAINABLE URBAN TRANSPORT SCENARIO, AS REFLECTED BY INDICATOR VALUES

Indicator/Values	Base Year (2013)	Business as Usual Scenario (2041)	Sustainable Urban Transport Scenario (2041)
Mobility and Accessibility			
Modal Share in %			
Modal Share of Walk	25%	20%	28%
Modal Share of Cycle	3%	2%	9%
Modal Share of Two Wheeler	48%	51%	20%
Modal Share of IPT	18%	22%	10%
Modal Share of Car	3%	3%	1%
Modal Share of Public Transport	3%	2%	32%
Trip Length (KM)			
Walk	1.18	2.06	1.89
Cycle	2.37	3.65	3.09
Two Wheeler	5.54	5.92	5.13
IPT	4.52	5.55	5.32
Car	7.06	7.51	6.56
PT	-	5	5.65
Accessibility			
% of HH within 10 minutes of walking to access PT (IPT for Base Year)	69%	60%	83%
LOS of PT facilities as per MoUD SLB Handbook	4	4	2
Landuse Mix Intensity			
Increase in the % of Intra-Zonal Trips as compared to Base Year (Base year value is 19%)	-	16%	68%
Safety to use NMT (user perspective)			
Walk	7.50%	7.50%	83%
Cycle	7%	7%	80%
Total Motorised Vehicle Kilometers (Thousand Kms)	880,489	2,559,907	1,335,210
LOS of NMT facilities as per MoUD SLB Handbook	4	4	2
Emission Levels Annual			
NOx (tonnes)	33,218	87,516	36,066
SO_2 (tonnes)	374	1,146	591
CO_2 (million tonnes)	25	48	24
PM10 level (tonnes)	10,731	25,714	8,737

URBAN MOBILITY PLANS

INTEGRATED LAND USE TRANSPORT PLAN

Increasing sprawl of urban areas due to development activities adversely affects the environment as human footprint spreads over a larger area resulting in increased movement from one point to another. Further, rising incomes and lack of proper planning can result in an unsustainable and automobile dependent society. Land use has crucial impact on travel demand and therefore it is vital that there is effective integration between land use and transport. Under Integrated Land use Transport Plan, the proposed schemes for Udaipur are:

- Increase in area under Commercial (retail), Education and Recreational such as parks etc. by 40%
- Increase in residential density along public transport corridor by 3 times of the existing gross density
- Provision of NMT friendly neighbourhoods (Development of pedestrian crossing facilities)

ROAD NETWORK IMPROVEMENT PLAN

The LCMP for Udaipur has suggested improvement of road network for overall enhancement of connectivity. As a part of its network improvement plan, the following aspects have been covered:

- Completion of bypass roads (in accordance with Udaipur Master Plan)
- Widening of Roads (in accordance with Udaipur Master Plan)
- Development of Road Hierarchy System

PUBLIC TRANSPORT IMPROVEMENT PLAN

Under the Public Transport Improvement Plan, several measures have been suggested in LCMP such as restructuring of IPT particularly 8-seater tempo through route rationalisation and adoption of strategies for sustainable City Bus Service, Introduction of public transport along 8 routes with coverage of 178 kms and headway of 5 minutes along trunk routes and headway of 15 minutes along feeder routes, improvement and development of adequate infrastructure for promotion of public transport and multi-modal integration and implementation of ITS for improving reliability of public transport.

NON MOTORISED TRANSPORT IMPROVEMENT PLAN

Provision of infrastructural facilities for NMT users was given due consideration while preparing the LCMP in order to increase the modal share of NMT, to provide safe NMT movement, to increase the public transport modal share, and to increase share of NMT trips in total. Under NMT Improvement Plan, various measures has been suggested such as development of differently-abled friendly foot paths, development of pedestrian crossing signals at 19 important intersections, improvement of old foot paths, development of cycle tracks, introduction of Bike Sharing Scheme, and provision of road markings, signages and street lighting facilities, among others.

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