Transport Infrastructure for Smart Cities in Hilly States

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Introduction

Smart City :

i. basic infrastructure,

ii. smart solution to make better infrastructure and services

iii. area based development.

Basic Infrastructure includes:

-Adequate Water Supply,

-Assured electric supply,

-Sanitation including solid waste management,

-efficient urban mobility and public transport,

-Affordable housing,

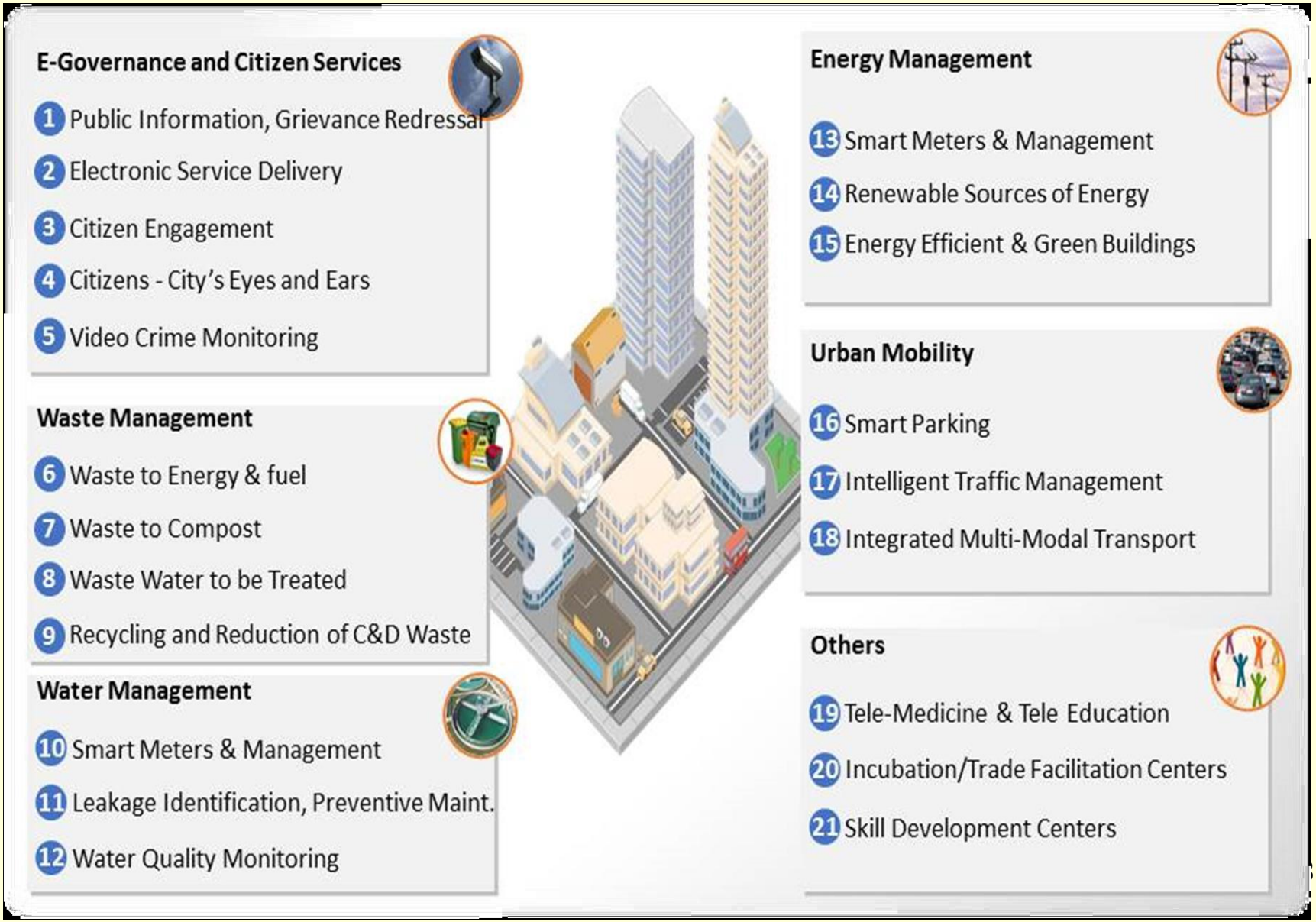
-Robust IT connectivity and digitization,

-Good Governance ,

-Sustainable environment,

ii. Pan- City Smart Solution

Applications of ICT in municipal services .



iii. Area Based Development

a. Existing Area

•**Retrofitting :** development of existing area > 500 acres to make it livable and efficient area.

•**Redevelopment :** Replacement existing built environment (area > 50 areas) and enable to make a new layout to enhance /upgrade infrastructure, allow mixed land use, increase in density, etc.

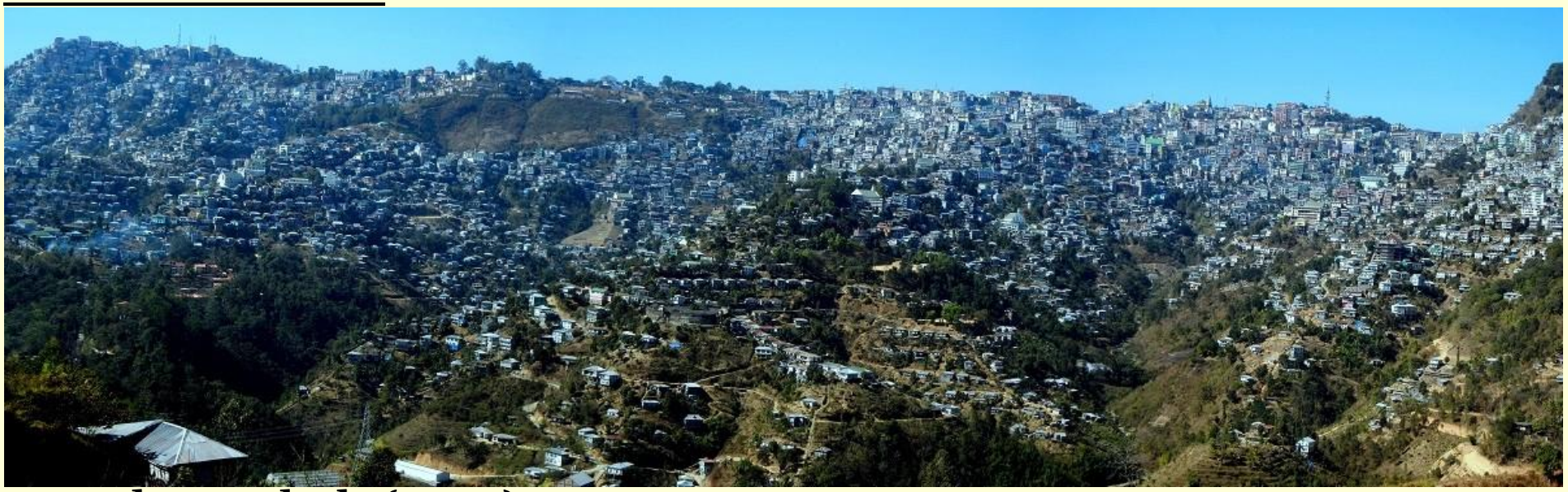
b. New Area

•Green Field Development : area > 250 acres with provision of affordable housing.

(80% buildings : Energy efficient green building,

15% of the building : Affordable housing category)

Hilly Cities under Smart Cities Mission



1. Dharmshala(H.P.)
2. Guwahati
3. Imphal
4. Agartala
5. Namchi
6. Kohima
7. Srinagar
8. Shimla
9. Dehradun
10. Pasighat (Arunachal Pradesh)
11. Jammu
12. Aizawl (in Photo)
13. Gangtok

Mode Share of Pedestrian (Walking) in Indian Cities, 2007

S.N.	Cities classified according to Population	% of Walking
i.	Less than 5 lakh Population (Plain Terrain)	34
ii.	**Less than 5 lakh Population (Hill Terrain)**	**57**
iii.	5-10 lakh Population	32
iv.	10-20 lakh Population	24
v.	20-40 lakh Population	25
vi.	40-80 lakh Population	25
vii.	More than 80 lakh Population	22

Source: Wilbur Smith Associates & the Ministry of Urban Development, Govt. of India, New Delhi .

1.0 Pedestrian Area in Hilly Cities

Pedestrian Areas
in Shimla (Mall Road)

Pedestrian Pathways

No Entry of Vehicles

Pedestrian Areas in Nainital (Mall Road)

- **Pedestrian Infrastructure** are relatively less costly and may be proposed as a separate project on priority basis.

Pedestrian Paradise
M.G.Road, Gangtok

2.0 Bus Infrastructure Components

- Road Design
- Bus Depots
- Bus Parking
- Signage

Bus Shelter

Fleet Size

Route Connectivity

Supporting Access (or Feeder) Infrastructure i.e.

provision for various modes to provide access & act as feeder to bus terminal.

parking for private vehicles; drop-off and pickup, bays for private vehicles, shared taxi, etc. bays/stops for local bus services.

Taxi as Mode of Public Transport in Aizwal (Mizoram)

Need of Modern Bus Shelters

Bus Shelters in Shimla

3.0 Aerial Ropeway Transit (Cable Car)

i. **Tourism Purposes**

Cable Car has attraction for pleasure trips to see 360 degree panoramic view.

To visualize natural beauty /natural scenery.

Manali Ropeway Cum Ski Centre, Himachal Pradesh

ii. Religious Purpose

Religious Purposes to reach Mountain tops / Mountain Temples for worship.

•Located in Bilaspur .

•Operation was started for convenience of the devotees to Nainadevi Temple.

Ropeway to Shrine of Makhdoom Sahib, Kashmir

It is Kashmir Valley's first ropeway and State's second tourist-carrier.

Source: The Hindu

iii. Material Transportation

Ropeway conveyor for Limestone transportation in Sweden

May be used to transport : veg./agriculture/forest products

:Tea Leaves from gardens to processing Units

ART : Environmentally Sustainable Transport

•Relatively Low Carbon foot prints.

•Electric Engine /Motor used at Stations.

•Greenhouse Gas emissions credit (Medellin Cable Car, Colombia).

•Cable car vehicles have no motors and therefore no noise and air pollution along the route.

•Little disturbance in Micro environment both during construction and operation.

ART (Ropeways/Cable Car) as Mass Transit

Example 1: Roosevelt Island Tramway, New York USA

•Opening Year :1976 but modernized in 2010 as dual-haul aerial tram

•Purpose : provide connectivity between **island to Manhattan** as island was redeveloped to accommodate low-middle income housing project.

•Mode : Mass Transit Service for Commuters

•Line Length : 960

•Line Speed : 26 km/hr

•Cabin capacity :110

•Peak Headway : 8 minutes

•PPDPH :1500

•Integration : Ropeway is integrated with New York's Metropolitan Transit Authority Metro Card with metro and bus transfer.

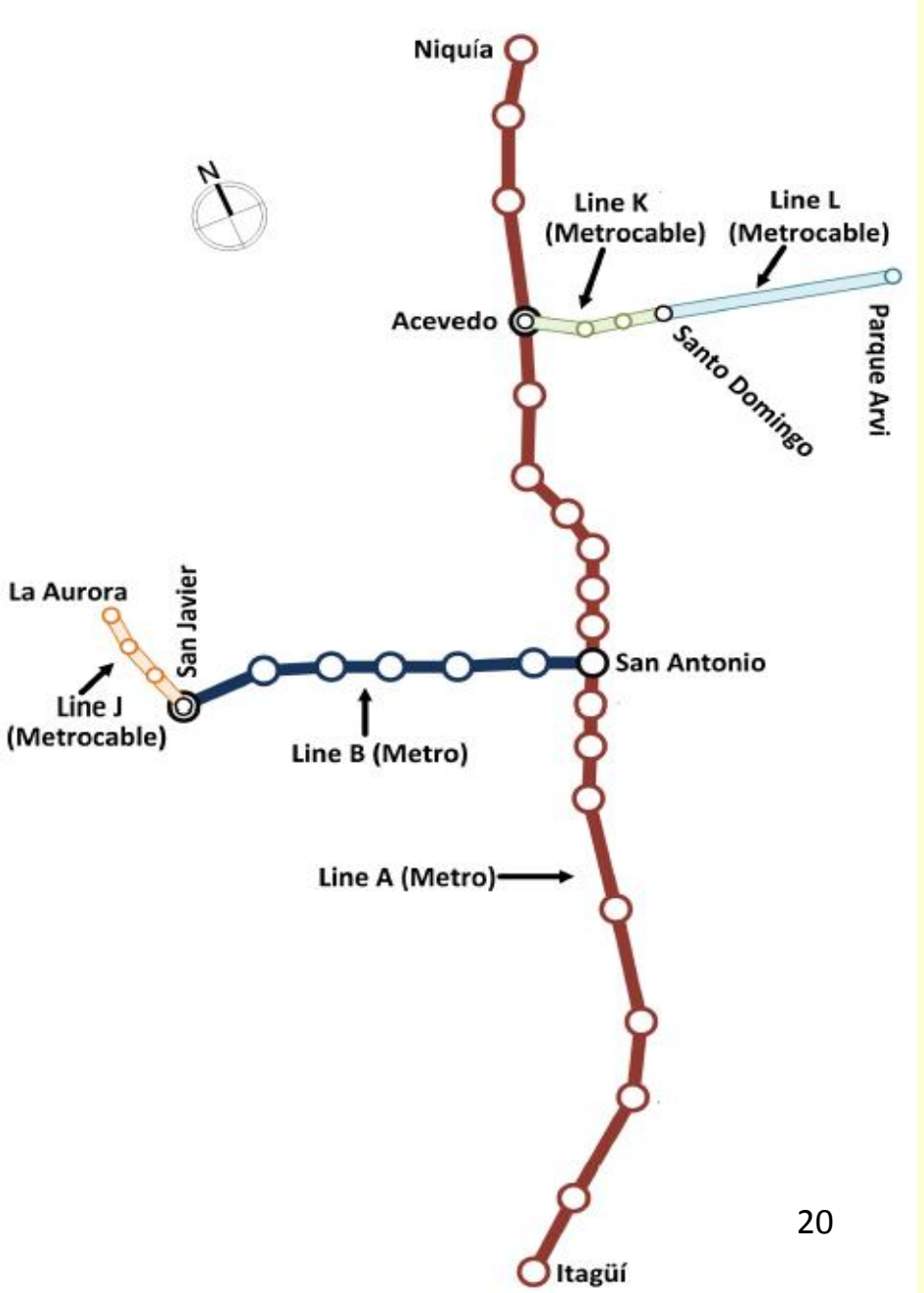
Example 2: Medellin Metro-Cable, Colombia

- **Purpose** : Medellin located in Valley surrounded by hills. To provide connectivity to barrios (rural Settlements), **gondola system was developed to connect Medellin hill residents to Metro** .

- **Opening Year** : 2006.

- First gondola line **(Line K)** was opened as complementary mode of transport to Medellin Metro.

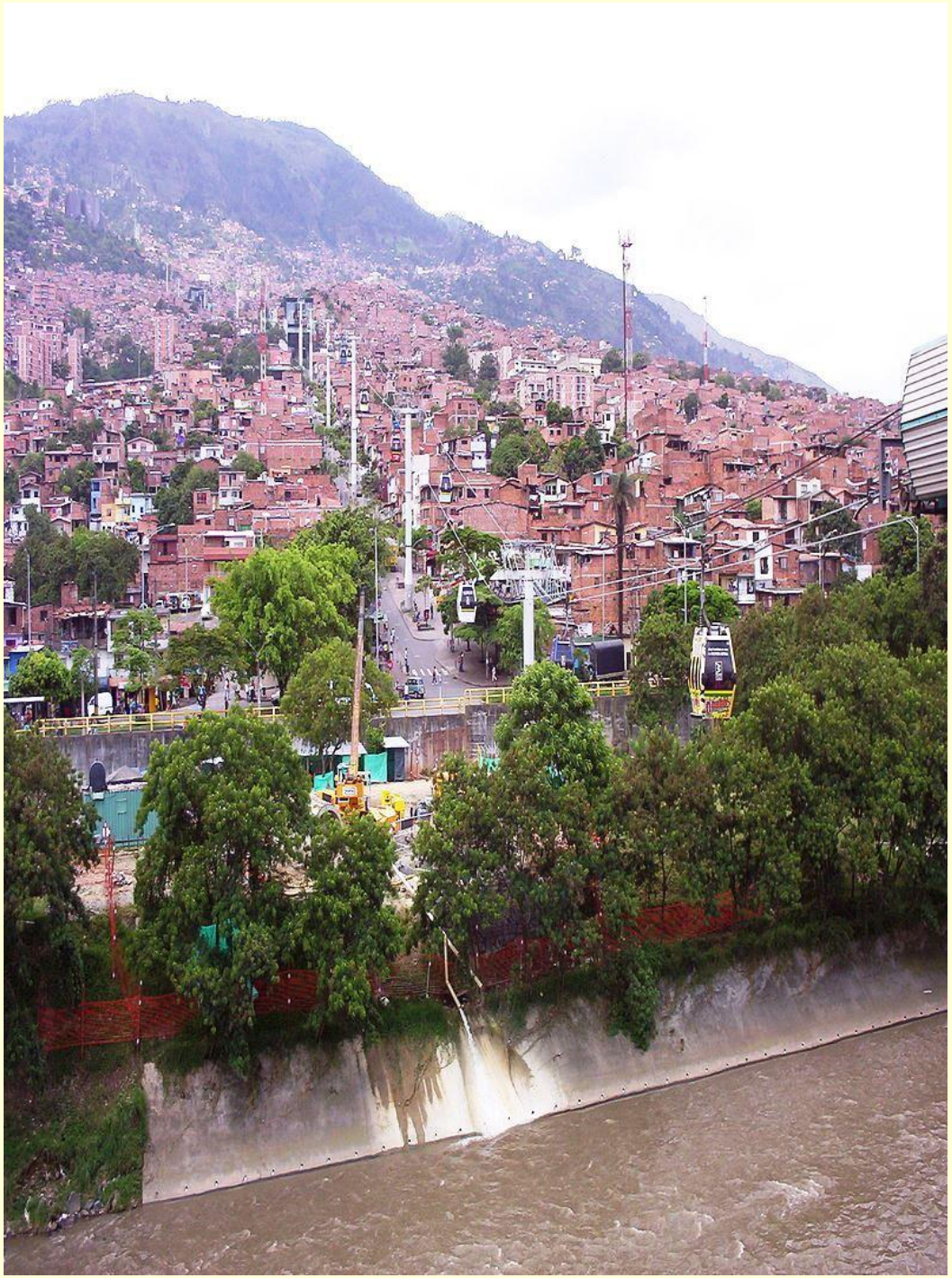
- **Mode** : Mass Transit Service



Line Length

Line K	=2789 mt
Line J	=2072 mt
Line L	=4595 mt

Line Speed	: 18-22 km/hr
Cabin capacity	: 10
Peak Headway	: 12-65 seconds
PPDPH	:550-3000



Cable Car : Haridwar to Rishikesh

हरिद्वार से ऋषिकेश तक उड़न खटोला चलेगा: महाराज

हरिद्वार। पर्यटन मंत्री सतपाल महाराज ने कहा है कि हरिद्वार से ऋषिकेश तक रोपवे मार्ग बनाया जाएगा। हरिद्वार से ऋषिकेश तक हवाल डेकर रोपवे चलाये जाने की योजना पर विचार किया जा रहा है। महाराज ने यह जानकारी शनिवार को जिला योजना समिति की बैठक में दी। पर्यटन मंत्री ने हरिद्वार को धार्मिक पर्यटन नगरी बनाने की बात कही। उन्होंने कहा, हरिद्वार से ऋषिकेश तक रोपवे का निर्माण किए जाने की योजना है। इसमें प्रत्येक उड़न खटोले में करीब अस्सी यात्रियों के बैठने की क्षमता होगी।

Source: Hindustan Delhi Edition dated 06.08.2017

RFP: Cable Car as Public Transport in Gangtok

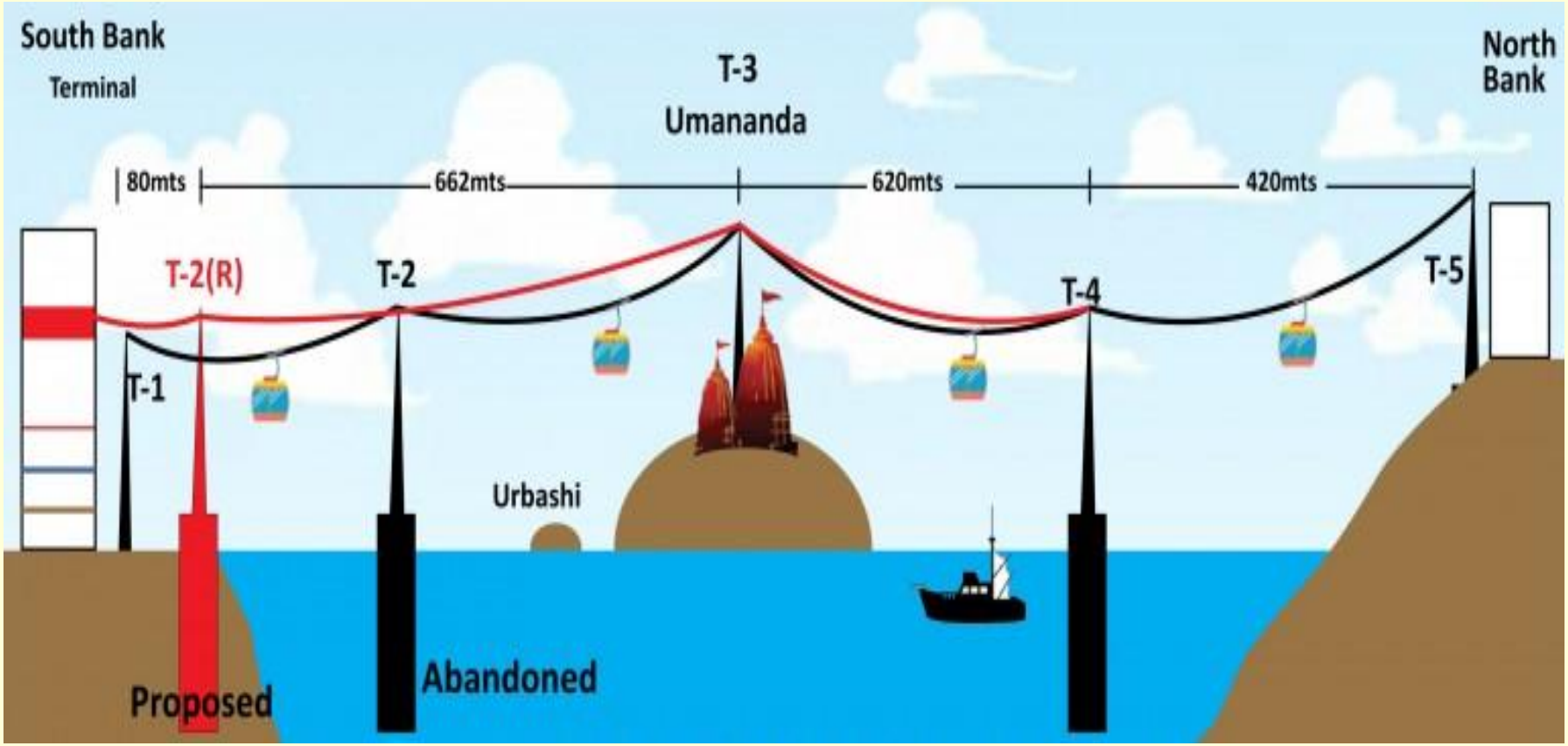
URBAN DEVELOPMENT & HOUSING DEPARTMENT

GOVERNMENT OF SIKKIM, GANGTOK

REQUEST FOR PROPOSAL (RFP)

On behalf of Governor of Sikkim, proposals are invited from firms / agencies for selection as consultant for preparation of "Techno-economic feasibility report of cable car as public transport for Gangtok". The RFP document will be available for download at www.sikkimudhd.org from 07.03.2016

R.O. No. : 403/IPR/PUB/Classi/15-16 *Date : 04/03/2016*



Schematic view of Guwahati Ropeway (Source: G-plus: Guwahati's English Weekly, dated July 04, 2016)

Transport Infrastructure should sustain:

-natural disaster conditions and

-crisis for mobility and connectivity.

Cable Car Accident in Kashmir's Gulmarg, June 25, 2017

Development along Cable Corridor

Planning of ART Corridor may promote :

-implementation of transit oriented development

-in newly developed or redeveloped areas.

THANKING YOU
FOR
YOUR KIND ATTENTION