





Background Studies for Working Policy and Guidebook

06c

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Preface

The Development Control plays an important role in guiding and facilitating the physical Development. Since the commercial development along with station redevelopment in the railway land is to be done under Section 11 of the Railways Act 1989, there was a need to have set of Manuals/Guidelines to guide the entire development. In fact the Union cabinet has approved (in terms of communication received from Ministry of Railways, GOI vide letter No. 2011/LMB.WCS/22/07/25 Pt.1 dated 17.10.2018) that 'Railways/RLDA/IRSDC shall consult urban local bodies/other statutory authorities while approving its plans in terms of powers conferred to it under Section 11 of the Railways Act 1989 so that the development in Railway Land is harmonious with surrounding development, generally following National Transit Oriented Development (TOD) Policy. No change in Land Use is required pan India by Railways for developing railway land for commercial use.' It is further approved that IRSDC shall be the Nodal Agency and the main Project Development Agency for redevelopment/development of all stations. MoHUA has also conveyed the approval of Union Cabinet to Chief Secretaries of All States/UTs to incorporate suitable provisions in the local byelaws/ development control norms in congruence with the National TOD Policy as well as relevant provisions of the Railways Act to facilitate Railways/RLDA/IRSDC to proceed with their development plans in consultation with local bodies/other statutory authorities, at the earliest.

Accordingly as the Nodal Agency for station redevelopment, IRSDC took upon the responsibility, on behalf of Railways/RLDA besides for guiding its own work for station redevelopment along with commercial development, to produce a series of Manuals/Guidelines to guide the Architects/Developers/Concessionaires as well as the Authority on the Procedures, Dos & Don'ts in preparing development plans and submitting the applications for approval of Layout Plans and Building Plans of the commercial development to IRSDC.

IRSDC aims to transform the railway stations and the adjoining land into a "RAILOPOLIS" - a Mini Smart 24/7 City Centre where one can live, work, play and ride while putting the land resources to optimal use following the National Transit Oriented Development Policy norms. The aim is to facilitate developments by streamlining policies and making the Manuals/Guidelines as transparent as possible to promote ease of doing business. The Manual on Form Based Codes explains various developments such as buildings set back, ground coverage, FAR, heights etc. while Manual on building plan approval and commercial assets covers the process for the approval of building plans. The Manuals are mandatory while the Guidelines are Recommendatory and the Development Agreement/Concession Agreement or any other legal agreement between IRSDC (Authority) and Developments/Concessionaires shall prevail over and above the guidelines.

The advantage of the Manual on Form Based Codes is that it facilitates flexibility in development of mix use (horizontal and vertical mixing) to make the development sustainable, user friendly and market responsive while most of the local building byelaws restrict mixing which is essential for development of TOD. The guidelines propose good practices related to Construction Standards that promote and protect health, safety and general welfare of the occupant and environment across its life cycle while permitting dynamic building use.

These "Manuals for Station (Re)development including Commercial Development" is a comprehensive set of documents which provide standards and guidelines in the following order of decreasing priority-

- 1. Safety Standards, (like fire safety, earthquake related controls, etc.)
- 2. Passenger and user comfort and convenience.
- 3. Environmental Conservation (Natural and Man-made)
- 4. Heritage Conservation
- 5. Design and aesthetic in harmony

These Manuals and Guidelines have been prepared over a period, after research, site visits, case studies, best practices, study of other similar national, international designs, National TOD Policy and Form Based Codes (as advised by MoHUA), National Building Codes, UBBL-2016 and Environment Management Guidelines issued by MoEF&CC. Some of these have also been applied and tested on the on-going projects of IRSDC.

PUBLIC CONSULTATIONS: The (draft) Manuals and Guidelines were posted on IRSDC's website. These documents are available for reference at- www.irsdc.in.The stakeholder consultation was held via six (6) national webinars during April 2021- July 2021. The attendees were provided with a brief overview of salient features of the Manual, Guidelines, etc. Over 1300 participants, which included about 25 Government Agencies, Educational Institutions, Professional Bodies, Centres of Excellence, and senior professionals, attended, and shared their valuable feedback during the Webinars and over emails.

These Manuals and Guidelines have now been adopted for Station Redevelopment Works after incorporating relevant feedback and other suggestions by all the stakeholders. Further, final draft Manuals and Guidelines were discussed in the Plan Sanctioning and Monitoring Committee (PSMC) where subject experts were also invited as special invitees in July 2021. IRSDC's Board of Directors (BOD) has also deliberated on this subject in August 2021 for adoption and application to the program of (re)development of Railway Stations along with Commercial Development. These Manuals and Guidelines are expected to transform the railway area around stations into model development as envisaged also by MoHUA and spur similar development in surrounding area.

SI. No.	Chapter/ Appendix	Content
1	Quantitative Analysis	Dating Railway Stations selected for Redevelopment, Summary of Findings
2	Qualifying Historic Railway Station	Qualifying Indian Railway Station Architecture and Planning Properties, Evolution of the Indian Railway Station and Station Area Design, Categorizing of Railway Stations and Station Areas (for Field Work)
3	Field Work and Case Studies	Field Work, Appraisal of Existing Laws and Norms, Summary of Case Studies
4	Appendix I: Excerpts from Field Work at Howrah, Shimla and Egmore Railway Stations	Howrah Railway Station, Shimla Railway Station, Egmore Railway Station
5	Appendix II: Comparative study of National Norms, Acts and Laws applicable to Heritage Protection	Findings UBBL 2016, Findings from AMASR Act (Amendment and Validation), 2010, Findings from Model Building Bye-Laws, 2016
6	Comparative study of Heritage Protection Norms of Selected Cities	Findings from Jaipur City, Findings from Ahmedabad City, Findings from Mumbai , Findings from Kolkata, Findings from Howrah, West Bengal, Findings from Chandigarh, Findings from Nagpur
7	Index	Abbreviations, Definitions of Terms Used, Combined References and Bibliography for 06a: Working Policy for RHA, 06b: Guidebook for Conservation of RHA and 06c: Background Studies for Working Policy and Guidelines

STRUCTURE OF THIS GUIDEBOOK FOR CONSERVATION OF RAILWAY HERITAGE ASSETS

The manuals and guidelines are intended to be comprehensive for promoting balance and orderly development of railway stations and surrounding city area. Manuals and Guidelines inter-alia provide the framework, necessary technique, norms and standards, and development promotion techniques. Conditions may vary from place to place and accordingly these manuals and guidelines may be applied to all situations and places by adopting to local conditions. These manuals and guidelines fulfil the need for a planning process which facilitate efficient and dynamic station development in overall urban framework.

The manuals and guidelines are also intended to be a possible reference for various aspects of urban planning and design by State Governments, Development Authorities, Private Sector and Planning Organizations.

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Section 0.1: About the Background Studies

Indian Railways envision that their Station Redevelopment works and Commercial Assets shall ensure Conservation of Heritage within their purview.

The Working Policy and Guidebook have been developed for the Indian Railways, so that Railway Station (Re)development work responds positively to Railway Heritage Assets (RHA). Departing from the conventional Monument-Centric approach, the focus of these documents are to render it functional, be an integral part of a new age high density Mixed-Use active public zone, support mixed income development, boost same-day tourism, converge diverse revenue streams and provide high-value employment.

The need for Policy and Guidelines for RHA emerged from a detailed study of ongoing consultancy works (in 2021) for Heritage Station Area, ToRs provided with the tender documents, deliberations and discussions with IRSDC representatives.

The Content of the Policy and Guidelines for Railway Heritage Assets were determined from the comparative study of:

- 1. National Normative Frameworks;
- Localized Normative Frameworks the Byelaws/Heritage Protection Norms of seven cities; &
- 3. Morphological evolution of Heritage Stations and Precincts.

This document is a compilation of all these studies conducted to establish the contents of 06a: Working Policy for Railway Heritage Assets and 06b: Guidebook for Conservation of Railway Heritage Assets.





Working Policy for Railway Heritage Assets contains Policy and Guidelines for Conservation, Management and Maintenance of the RHA.



GuidebookforConservationofRailwayHeritageAssetscontainsguidelinesforimplementingtheWorking Policy.

 Table 1: Schedule of remaining parts of the Manuals for Station Redevelopment including Commercial

 Development

Handbook for Station Planning (for internal use only)



This document contains Norms, Standards and Tools for Design of Station Operational Areas.

Guidebook for Form Based Codes



This document assists in preparation of Layout Regulating Plans and Property Development Card.

Guidebook for operationalizing National TOD Policy for Railway Station (Re)development





This document contains Tools and Processes for Layout Planning within the Railway Land, with the intent of 'Land Value Capture' for optimum monetization.

Manual for Building Plan Approval of Commercial Assets



This document contains the procedures and parameters for the approval of Building Plan of Commercial Assets.

Manual of Form Based Codes for Station (Re)development



This document contains (a) Development Control Norms (b) Format for preparation of Layout Regulating Plans and (c) Parameters of Property Development Card.

Environment Management Guidelines for Railway Station (Re)development



This document contains guidelines for integrating provisions of Environment Management during Layout Planning and is based on the recommendations issued by MoEF&CC, NGT and other statutory bodies.

Chapter 1: Quantitative Analysis

Section 1.1: Dating Railway Stations selected for Redevelopment

This exercise was done as a part of Need Assessment of the Working Policy, and to identify the range of RHA.

NOTE: The years written in italics indicate when the Railway Lines started operation, whereas the others are years when the Station Building was established.

Table 2: Dating Railway Stations selected for Redevelopment

-		
S. No.	Station	Date of Establishment
1	Abu Road	1880-81
2	Agra Fort	1874
3	Ahmednagar	1878
4	Akbarpur	1873
5	Akola	1867
6	Alappuzha	1989
7	Aligarh	1865-66
8	Alipurduar Junction	1901
9	Allahabad	1859
10	Aluva	1902 (Shoranur–Cochin Harbour section)
11	Alwar	1874-75
12	Amravati	1867 (Nagpur– Bhusawal section of Howrah–Nagpur– Mumbai line)
13	Anakapalle	1897 (Duvvada– Vijayawada section)
14	Anantapur	1892-93
15	Ankleshwar	1860 (Ankleshwar Junction to Utran
16	Anugraha Narayan Road	1907 (Gaya– Mughalsarai section)
17	Ara Junction	1911
18	Arakkonam Junction	1871
19	Asansol	1863-64
20	Aurangabad	1900
21	Ayodhya	1874
22	Azamgarh	1898-1903
23	Badnera	1860-67
24	Bakhtiyarpur Junction.	1903 (Bakhtiyarpur– Bihar Sharif light railway)
25	Balasore	1893-96
26	Ballabgarh	1886 (Kanpur-Delhi Section)
27	Ballia	1892

S.	Station	Date of
No.	Clatton	Establishment
00	Danda	1889 (Jhansi–Manikpur
28	Banda	line opened by Indian
20	Dandal	
29	Bandel	1854
30	Bandikui	1874
31	Bangalore Cantonment	1864
32	Bangarpet	1864
33	Bapudham	1886 (Barauni–
55	Motihari	Samastipur section)
34	Barabanki	1872
35	Barauni Junction	1883
36	Barddhaman	1854-55
~-	-	1902 (Marwar Junction–
37	Barmer	Munabao line)
~~		1857 (Eastern Bengal
38	Barpeta Road	Railway)
39	Basti	1846
40	Bathinda Junction	1884
41	Beas	1870 (Ambala–Attari line)
42	Belgaum	1887
43	Bellarv	1896
44	Belthara Road	1930 (Allahabad– Mau– Gorakhpur main line + Varanasi-chhapra line)
45	Bettiah	1883 (Samastipur to Muzaffarpur Branch of the Tirhoot State Railway)
46	Betul	1924 (Bhopal–Nagpur section)
47	Bhadohi	1898 (Varanasi–Rae Bareli–Lucknow line)
48	Bhadrak	1893-96
	Bhandara	
49	Road	1888
50	Bharatpur	1866 (Mathura–Kota section of New Delhi– Mumbai main line)

S. No.	Station	Date of Establishment
51	Bharuch	1914 (Bharuch– Jambusar branch)
52	Bhavnagar Terminus	1880
53	Bhilai Power House	1956
54	Bhilwara	1885
55	Bhimavaram Town	1899
56	Bhiwani	1884
57	Bhusawal	1866
58	Bijapur	1884
59	Bikaner	1889-91
60	Bina	1923 (Bina-Katni Line)
61	Bokaro Steel City	1907
62	Bongaigaon	1963-65
63	Brahmapur	1893-96
64	Burhanpur	1870 (Jabalpur– Bhusaval section)
65	Buxar	1862 (Patna– Mughalsarai section; Howrah-Delhi main)
66	Chakki Bank	1952
67	Chalisgaon	1860
68	Champa Junction	1887-1891 (Tatanagar- Bilaspur section of the Howrah– Nagpur– Mumbai line)
69	Chandausi	1872-73
70	Chandrapur	1929 (New Delhi– Chennai main line)
71	Chengalpattu Junction	1880 (Chennai Egmore– Kumbakonam– Thanjavur line)
72	Chengannur	1958
73	Chirala	1899 (Vijayawada– Chennai section
74	Chittorgarh Junction	1874-81
75	Coochbehar	1894
76	Cuddapah	1866
77	Cuttack	1893-99
78	Daltonganj	1924 (Railway Line from Patratu to Son Nagar)
79	Damoh	1923 (Bina–Katni line)
80	Danapur	1925
81	Davangere	1884 (Bangalore Harihar Railway, a section of the Mysore State Railway)

S. No.	Station	Date of Establishment
82	Dehri-On- Sone	1906
83	Delhi Cantonment	1875 (Delhi–Jaipur line)
84	Delhi Shahadra	1975 (Delhi Ring Railway)
85	Deoria Sadar	1930 (Allahabad– Mau– Gorakhpur main line)
86	Dharwad	1920
87	Dibrugarh Town	1883
88	Digha	2004
89	Dimapur	1903
90	Dindigul Junction	1990 (Karur and Madurai Junction)
91	Durgapur	1855
92	Eluru	1893-96
93	Ernakulam Town	1890
94	Erode Junction	1862
95	Etawah	1860-66
96	Faizabad	1874
97	Falna	1881 (Jaipur- Ahmedabad Line)
98	Faridabad	1904
99	Fatehpur	1859
100	Firozpur Cantonment	1905-1912
101	Gandhidham	1955
102	Ghaziabad	1865-66
103	Gomoh Junction	1906
104	Gonda Junction	1982
105	Gudur Junction	1893-99
106	Guntakal Junction	1872; 1890 (Goa- Guntakal Metre Gauge) 1892-93 (Guntakal- Bangalore)
107	Guntur Junction	1916
108	Gurgaon	1876 (Rajputana-Malwa Railway)
109	Hajipur Junction	1886 (Hajipur– Muzaffarpur– Samastipur– Barauni)
110	Hanumangarh Junction	1901-1902 (Jodhpur– Bathinda line)
111	Hapur Junction	1900 (Delhi– Moradabad line)

S. No	Station	Date of Establishment
110.		1870 (Delhi–Meerut–
		Saharanpur)
112	Hardoi	1872
		1961 (Netaji S.C. Bose
113	Hatia	Gomoh–Hatia)
	Tratia	1965 onwards (Hatia–
11/	Hisar	1873
114	TISA	1924 (Rhonal-Nagnur
115	Hoshangabad	section)
116	Hospet	1884 (Hospet-Bellary)
117	Hubli	1886
118	Itarsi	1870
		1870 (Amritsar-
119	Jagadhri	Ambala- Jagadhri-
100		Saharanpur-Ghaziabad)
120	Jaisaimer	1921
121	Jajpur- Keonihar	1896
121	Road	1000
122	Jalgaon	1860
400	Jallandhar	4070
123	Cantonment	1870
124	Jalna	1905 (Secunderabad-
		Manmad Line)
125	Jamalpur	1862
126	Jamnagar	1897
127	Jamui	1871 (Howrah-Patna- Mughalsarai Line)
		1906-07 (Janghai -
128	Janghai	Allahabad-Jaunpur
400	la aidih	Branch)
129	Jasidin	1871
130	Jaunpur	1872
131	Jaynagar	1902
132	Jharsuguda	1891
400	la alta ani	1887-1901 (Barauni–
133	Jogbani	Katinar, Sanarsa and Purnia sections)
101		1884 (Jorehaut
134	Jornat Town	Provincial Railway)
135	Kakinada Town	1893
136	Kalka	1891
137	Kamakhya	1889 (Barauni- Gauhati Line)
138	Kanhangad	1907 (Shoranur- Mangalore Section)
139	Kanyakumari	1972
140	Kannur	1907
141	Karnal	1891

S. No	Station	Date of Establishment
142	Karur Junction	1866
143	Kasargod	1898
144	Kathqodam	1884
145	Katihar Junction	1889
146	Katni	1870 (Howrah– Allahabad–Mumbai line)
147	Katpadi	1864 (Chennai Central –Bangalore City line)
148	Kayamkulam Junction	1958
149	Kazipet Junction	1874-89
150	Kengeri	1882 (Mysore– Bangalore line)
	Khagaria	1883 (Samastipur–
151	Junction	Khagaria line)
152	Khalilabad	1885 (Gorakhpur– Basti–Lucknow line)
153	Khammam	1889 (Kazipet– Vijayawada section)
154	Khandwa	1866
155	Khurda Road	1897
156	Kishanganj	1915
157	Kiul Junction	1864
158	Koderma	1906-1907 (Asansol– Gaya section of Howrah–Gaya–Delhi line)
159	Kolhapur	1886
160	Kolkata Terminal	2003-06
161	Kollam Junction	1904
162	Kopargaon	1878 (Manmad-Daunde broad gauge line)
163	Kottayam	1956
164	Kovilpatti	1891
165	Krishnarajapur am	1882 (Bangalore- Chennai Main line)
166	Kumbakonam	1877
167	Kurduwadi	1859-97
168	Kurnool Town	1930 (Secunderabad– Dhone section)
169	Lalgarh	1901 (Dulmera- Suratgarh Line of Jodhpur-Bikaner Railway)
170	Lalitpur	1880 (Bhopal-Jhansi Section via Bina)
171	Latur	1897

S. No.	Station	Date of Establishment
172	Lumding	1900-03
173	Madhubani	1902
174	Madhupur	1871
175	Mahesana	1881
176	Mahoba	2008 (Mahoba- Khajuraho)
177	Maihar	1867
178	Malda Town	1971
179	Mancherial	1929 (Kazipet– Balharshah section)
180	Mangalore Central	1907 (Shoranur– Mangalore section)
181	Mangalore Junction	1907 (Madras Railway trunk route extended from Calicut to Mangalore)
182	Manmad	1866
183	Marwar Junction	1881
184	Mau Junction	1872
185	Mayiladuthurai Junction	1926
186	Meerut Cantonment	1864-65
187	Meerut City	1911
188	Mettupalayam	1873 (Coimbatore– Mettupalayam line; Nilgiri Mountain Railway)
189	Miraj	1886
190	Mirzapur	1864-66
191	Mokama	1862 (Delhi–Kolkata main line via Mughalsarai–Patna route)
192	Moradabad	1873
193	Morena	1904-1909 (Gwalior Light Railways)
194	Muzaffarnagar	1870
195	Mysore	1870
196	Nadiad	1945
197	Nagarsol	1905 (Secunderabad– Manmad line)
198	Nagaur	1924 (Jodhpur- Bikaner Railway)
199	Nagda	1896 (Nagda–Ujjain section)
200	Nagercoil	1979
201	Naihati Junction	1862

S. No.	Station	Date of Establishment
202	Nanded	1905 (Secunderabad– Manmad line)
203	Narkatiaganj Junction	1930 (Muzaffarpur– Gorakhpur main line)
204	Navsari	1866
205	New Alipurduar	1950 (Barauni– Guwahati line)
206	New Bhuj	1908 (Gandhidham– Bhuj section)
207	New Coochbehar	1966
208	New Farakka	1971
209	Nizamabad	1905
210	Ongole	1899
211	Orai	1889 (Jhansi-Kanpur section)
212	Palakkad Junction	1861 (Jolarpettai– Shoranur line)
213	Palanpur	1952
214	Palasa	1893-96
215	Pali Marwar	1882
216	Panipat	1891-97
217	Panvel	1962
218	Parasnath	1906
219	Parbhani Junction	1860
220	Pratapgarh	1898 (Varanasi–Rae Bareli–Lucknow line)
221	Pathankot	1884
222	Patiala	1887
223	Patna Sahib Junction	1861
224	Payyannur	1907 (Shoranur– Mangalore section)
225	Phagwara	1870
226	Phaphund	1886
227	Phulera	1941 (Merta Road– Rewari line)
228	Pipariya	1870 (Jabalpur– Bhusaval section)
229	Purnea Junction	1887
230	Rae Bareli Junction.	1898 (Varanasi–Rae Bareli–Lucknow line)
231	Raichur	1871
232	Raiganj	1889
233	Raigarh	1895 (Tatanagar– Bilaspur section)
234	Raja Ki Mandi	1904-10
235	Rajahmundry	1899

S. No.	Station	Date of Establishment
236	Rajendra Nagar Terminal	2003
237	Rajnandgaon	1878-80
238	Rajpura Junction	1900
239	Rameswaram	1906
240	Rampur	1894
241	Rampurhat	1971 (Howrah–New Jalpaiguri Line, Sahibganj Loop Line)
242	Ranchi	1907-08
243	Rangiya Junction	1909
244	Rani	1931 (Jaipur– Ahmedabad line)
245	Ratlam	1967 (Diesel Loco Shed at Ratlam)
246	Raxaul Junction	1927
247	Rayagada	1931
248	Renigunta	1862
249	Rewari	1873
250	Rohtak Junction	1897 (Delhi–Fazilka line)
251	Roorkee	1845 (Piran Kaliyar to Roorkee)
252	Rourkela	1891
253	Rudrapur City	1884 (Bhojeepura- Kathgodam RandKR Mainline)
254	Sagauli Junction	1930s (Muzaffarpur- Gorakhpur Main Line)
255	Saharanpur Junction	1870 (Amritsar - Saharanpur-Ghaziabad)
256	Saharsa Junction	1887
257	Sainagar Shirdi	2009
258	Salem Junction	1860
259	Samalkot Junction	1899
260	Samastipur Junction	1874 (Samastipur- Darbhanga Metre Gauge)
261	Sambalpur	1963
262	Sasaram Junction	1914 (Arrah-Sasaram)
263	Satna	1870 (Howrah- Allahabad- Mumbai Main Line)
264	Saugor	1923 (Bina-Katni Line)

S. No.	Station	Date of Establishment
265	Sawai Madhopur	1907
266	Secunderabad	1874
267	Shahganj	1972-74
268	Shahjahanpur	1873 (Lucknow– Moradabad line)
269	Shalimar	1905 (rebuilt in 2000)
270	Shegaon	1867 (Nagpur– Bhusawal section)
271	Shimoga Town	1931
272	Shoranur Junction	1862
273	Silchar	1898
274	Siliguri Junction	1949
275	Singrauli	1982
276	Sirhind Junction	1870
277	Siwan	1909 (Varanasi
279	Junction	Chnapra Line
270	Sri	
279	Ganganagar	1923-32
280	Srikakulam Road	1893-96
281	Sathyasai Prasanthi Nilayam	2000
		1872 (Varanasi–
282	Sultanpur	Lucknow via Sultanpur– Jaunpur main line)
283	Suratgarh	1901-1902 (Jodhpur– Bathinda line)
284	Surendranaga r	1872
285	Tadepalligude m	1916
286	Tambaram	1931 (Chennai Beach– Tambaram section of the Chennai Suburban Railway Network)
287	Tenali Junction	1899
288	Thalassery	1901
289	Thanjavur Junction	1880
290	Tinsukia	1903 (ABR line from Chittagong to Lumding to Tinsukia)
291	Tiruchchirapp alli Junction	1859
292	Tirunelveli Junction	1893

S. No.	Station	Date of Establishment
293	Tiruppur	1983 (Chennai- Palakkad Broad Gauge Line)
294	Tirur	1861
295	Tiruvalla	1956 (Ernakulam– Kottayam– Kavamkulam line)
296	Tundla	1866
297	Tuni	1893-1896 (Visakhapatnam– Vijayawada section of Howrah–Chennai main line)
298	Tuticorin	1874
299	Udaipur City (Tripura)	2016
300	Udhampur	2005
301	Udhana	1870 (Udhna-Jalgaon Line; Howrah- Allahabad-Mumbai Main Line)
302	Ujjain	1876
303	Unnao	1867
304	Vadakara	1907
305	Valsad	1925
306	Vapi	1870 (Ahmedabad- Mumbai Main Line)
307	Vasco-Da- Gama	1886 (Marmagao and Vasco Metre Gauge)
308	Veraval	1897
309	Vidisha	1889 (Agra-Bhopal Section)
310	Villupuram Junction	1879
311	Viramgam	1871
312	Virudhunagar Junction	1904 (Kollam– Sengottai Chord Line)
313	Vizianagaram	1898-1900
314	Warangal	1889 (Kazipet– Vijayawada section)
315	Wardha	1867
316	Yadgir	1871 (Guntakal- Wadi (Excl) line)
317	Agra Cantt	1904
318	Ahmedabad	1866
319	Ajmer	(1951) Ajmer Railway division

S. No.	Station	Date of Establishment	
	Ambala		
320	Cantonment Junction	1891	
321	Andheri	1928	
322	Ballarshah	1929	
323	Bandra Terminus	1990	
324	Bangalore City	1915-18 (Mysore State Railway)	
325	Bareilly	1873	
326	Bhagalpur	1861	
327	Bhopal	1910	
328	Bhubaneswar	1896	
329	Bilaspur Junction	1889	
330	Borivali	1928 (Western line from Churchgate to Borivali)	
331	Chennai Central	1873	
332	Chennai Egmore	1905	
333	Chhapra Junction	1909 (Varanasi Chhapra Line)	
334	Coimbatore Junction	1861	
335	Chhatrapati Shivaji Terminus (CSTM)	1853-88	
336	Dadar	1868	
337	Darbhanga Junction	1875	
338	Daund	1870	
339	Dehradun	1899	
340	Delhi Junction	1864 (rebuilt in 1903)	
341	Dhanbad Junction	1880-94	
342	Gaya Junction	1879	
343	Gorakhpur Junction	1886-1930	
344	Gulbarga	1871	
345	Guwahati	1900	
346	Hazrat Nizamuddin	1859 (Northern Railway zone)	
347	Haridwar	1886	
348	Howrah	1854	
349	Hyderabad Deccan (Nampally)	1907; (1870 construction of Railway linking Hyderabad to GIPR)	
350	Indore	1893 (rebuilt in 1921)	

S. No.	Station	Date of Establishment		S. No.	Station	Date of Establishment
351	Jabalpur	1867-70 (Allahabad -	;	370	Nasik Road	1866
250	1-1-1	Jabalpur branch)		371	New Delhi	1926
352	Jaipur	1895		372	New	1960
353	Jalandhar City	1804	-		Jalpaiguri	
354	Jammu Tawi	reopened in 1975)	;	373	Junction	1862
355	Jhansi	1880		374	Pune	1858
356	Jodhpur	1885	;	375	Puri	1897
		1861 (Jolarpettai–		376	Raipur	1888
357	Jolarpettai	Shoranur line) 1864 (Iolarnettai-		377	Rajkot	1890
	Junction	Bangalore)		378	Sealdah	1862-69
358	Kachiguda	1916			Shri Mata Vaishno Devi Katra	2014
359	Kalyan	1954	1954 379			
360	Kanpur Central	1930	;	380	Solapur	1860
361	Kharagpur	1898-99		381	Tatanagar	1910
362	Kozhikode	1888		382	Thane	1853
	Lokmanva	(00)		383	Thrissur	1902
363	Tilak Terminal	1991		384	Thiruvanantha	1931
364	Ludhiana	1864-1901		295	Vadadara	1961
365	Madurai	1859		305	Vauouara	1862 (first line from
000	Mathura	4004		386	Junction	Howrah-Varanasi)
366	Junction	1904		387	Vijayawada	1888
367	Mughalsarai Junction	1860-62	;	388	Visakhapatna m (erstwhile	1896
368	Mumbai Central (Main)	1930		389	Waltair) Yeshwantpur	1892 (Yeshwantpur-
369	Muzaffarpur	1886			. contrainput	Doddaballapur MG)

Section 1.2: Summary of Findings

Establishment dates for 389 stations have been ascertained through credible sources. Stations, whose specific date of establishment was not found, the lines that the station is part of (main lines, sections or branches), were ascertained. All the stations provide information on incremental growth of the Indian Railways.

Table	3:	Summary	of	Findings
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Date of establishment	No.	%	
1845-1860	22	5.7%	65.6% Station Buildings and Station
1861-1900	229	58.9%	Areas owned by the Indian Railways
1901-1947	95	24.4%	the first generation of
1947-1991	34	8.7%	establishment.
1992-2020	9	2.3%	

Chapter 2: Qualifying Historic Railway Station

Section 2.1: Qualifying Indian Railway Station Architecture and Planning Properties

To identify and qualify the properties of Railway Heritage Asset (RHA), a study of the Indian Railways stations constructed since the 1850s was done to understand the original planning and design principles, functions, parts of a Station and within their respective geographical conditions. (Figure 1: Station Design and Planning Determinants) below shows how functionality and geography have determined Layout Planning and design of the Station Building(s) and Station Areas. It is the permutation and combination of these parameters that characterize, and determine the land use surface and utilization patterns, road network, among other facets of a Railway Station and Station Area.



Figure 1: Station Design and Planning Determinants

2.1.1. Functional Classification of Stations

The four (4) functional Categorization and corresponding Design Inputs are:

Type 01 – Passenger or Goods: Classification based on primary objects of handling, i.e. Passenger or Goods, or both. Most of the Goods Stations were contiguous to wholesale or retail areas of cities - and the interface between the Railway and city had infrastructure for transaction, loading-unloading and auction areas, storage, custom houses and other offices, and sometimes ports or other features that supported trade. Over time, several of these Stations were provided with infrastructure related to passengers on need-basis. Pure Passenger stations were far and few, as the Railways were primarily meant to transfer goods, the military, and thereafter, passengers. Some of the key facilities allocated for passengers included retiring rooms, provision for water and refreshments, and furniture on platforms within the Station Building. In the interface between the city and the Railway station, some key passenger facilities included an impressive public space, bazaars, entertainment facilities (like cinemas and circus) and multi-modal integration.

Type 02 – Terminals, Junctions, Ports and Halts: Terminal and Junction Railway stations could exist as mutually stand-alone, or in a combination with each other. In terms of hierarchy of importance and network density, Junctions were the most important, followed by Terminals, and then Halts. Port-Junctions (Howrah station), or Port-Terminals (Chhatrapati Shivaji Maharaj Terminal, Mumbai), or Port-Station (Marmugao) were at the apex of its international network, and still are the most promising in terms of Value-Capture - whereas Terminal stations have a deeper connect with the city core and major infrastructure. The presence of institutions - banks, ports, municipalities, City-Trust offices, revenue offices, wholesale markets and other anchor facilities - are the key indicators of the importance of a Railway station and Station Area. The Halt Stations were lowest in the hierarchy, where a few Passenger trains stopped for a short duration.

Type 03 – Narrow, Broad and Metre Gauge: This categorization has a direct effect on the design of Station Building and its operational area. Upgrading from a Narrow to bBroad or Metre Gauge, or laying of additional tracks, may require an offset of Station Building onto the land adjacent to it, or its extension. In either case, the position and movement of passengers - away from the Station Building towards the city - has a direct bearing on the Station Building, spaces and location of supporting infrastructure. Hence, this was factored in while drafting the Working Policy and Guidebook.

Type 04 – A to F¹: Categorization of stations A to F by the Ministry of Indian Railways, Gol is based on annual passenger earnings. It is an indicator of passenger traffic, and the need for a proportionate quantum and scale of passenger amenities - Minimum Essential, Recommended and Desirable amenities).

2.1.2. Geographic Classification of Stations

Geographic distribution of Station Areas provided the following two Design Inputs:

Type 01: Design response to Climatic and Topographic conditions demonstrated the adoption of local ornamental features, material and passive energy management techniques by the British to important international architectural forms that shaped Station Building and its contiguous areas.

Type 02: Design response to Natural hazards, risks, and disasters conditions.

¹ Before 2017, the criteria of categorization for Indian Railway Stations were based on the type of their functions – and were classified as Goods, Passenger or Military stations. As passenger traffic increased with the growing connectivity of the Railway network and ease of travel, this increased the demand for passenger amenities.

To give due consideration to the planning of a Station Area from the perspective of passenger footfall, earnings and strategic importance, Railway stations were re-categorized into seven categories: A, A1, B, C, D, E and F. However, since 2017-18, Railway stations are now classified into three groups based on passenger footfall -- Non-Suburban (NSG), Suburban (SG) and Halt stations (HG). The performance of stations' classification shall be reassessed after 2022-23.

Section 2.2: Evolution of the Indian Railway Station and Station Area Design

2.2.1. Evolution of Architectural and Layout Design Principles

Following a basic classification of design determinants, research was conducted to study how Layout Planning, Architecture, Aspects of management, and Monetization evolved over time. The focus was to understand how and why different functions were added, upgraded, abandoned or repurposed from time to time - and how technology and socio-economic-political conditions co-evolved the operational and non-operational parts of a Railway station and Station Precinct. What is important to note is how the Codes, Norms, Safety and Design standards, Laws, System of ownership and Leasing of land, Monetization et al, have evolved and manifested in the Built-Form over time.

Additionally, it also enabled the identification of the complementary relation between the Railway Station Precinct and the city, developed an approach to study and conduct field work for drafting the Working Policy and Guidebook, and to assist IRSDC/Technical Consultants in Upgradation works.

(*Table 5: Chronological Evolution of Design Principles of Indian Railway Stations and Station Areas*) below provides information on design evolution of Indian Railway station and Station Area, and Section 2.2.2. (*Table 6: Distribution of immovable Railway Heritage Asset and Heritage Asset in Station and Station Area*) is a list of facilities and amenities that were integral to the Railway System.

Table 4: Chronological Evolution of Design Principles of Indian Railway Stations and Station Areas

Date	Design and Layout Characteristics						
	Pre-1857						
1850	The architectural style of the first Railway stations built in India in the early 1850s was similar to that of the European stations in 1830. These had simple wooden beams and terracotta roofs, and the Stations seemed to be a part of the landscape. Local materials were used for the Station Building, reminiscent of villages and small town structures. Descriptions, mostly in the form of paintings and personal diaries, depict crowds assembled in attitudes of ease and mingling freely. They were perhaps suggestive of the aspirations of the promoters of Railway stations – as a new and inclusive public sphere of commerce. (<i>Bear, Chapter 2: An Indian Traveling Public, 1850-1900. 2007</i>)						
	 Railways in India produced a distinct series of public offices, of which many were international establishments. Railways owned all land within the fences and the boundary marks and could exclude from their premises "persons not having any business on such premises," and could "impose any terms they consider proper as conditions for admittance." This rule, however, did not apply to platforms as these were not owned by the Railways then. (<i>Bear, Chapter 2: An Indian Traveling Public 1850-1900, 2007</i>) 						
1854	• Railway Stations were classified into four groups based on Purpose, Traffic type and Volume, and the Proportion of European and Indian passengers. Some of the high-capacity Railway stations of today, such as Howrah station, was just a tin shed with a small booking office, and a single platform. (<i>IRFCA - The Indian Railways Fan Club 2010</i> , 2010)						
	1857- 1900						
	 Salient features of the Railway colonies in the given era. The layout of Railway colonies for European and Eurasian workers were: Planned as self-sustained areas having water supply, municipality, bottling plants and bakeries. Public spaces were designed based on biography (of rank) of officials. Publics 						
	 Public spaces were designed based on merarchy (or rank) or omclais. Bungalows with large gardens were provided to the senior officers. Single story cottages and double-story flats were built for drivers and guards, closer 						
	to the Railway stations.						
	• Six types of houses built with varying facilities, and allocated as per rank.						
	 Type T were the low-level barrack houses with a room, veranda and bathroom. Type 2 were allotted for skilled workshop employees 						
	 Type 3 were for junior supervisors, technical positions, junior locomotive drivers, etc. 						

Date	Design and Layout Characteristics
	 Type 4 for senior supervisors, drivers, staff nurses, probationary officers, office superintendents, and Station masters. Type 5 were for administrative grade officers with 10 years of experience. Type 6 were for those with more than 20 years of service. Only 50% of the Railway staff were housed in the Railway colony. Railway Volunteers ground was used for drill practices, to defend the colony in times of emergency. Own components of the Railway Station Area included primary schools, guest houses, offices, workshops (for overhauling locomotives, passenger cars and freight cars), and separate workshops for women (for specialized components of locomotives) and official liquor shops. Other facilities found inside the Railway land included Sports tracks and arena, Railway institute, Masonic lodge, churches, hospitals, cemetery, etc. Functions of certain building spaces have also changed across time e.g. in Kharagpur, the ground floor of Railway Institute has been converted into a cinema hall. (<i>Bear 2007</i>)
1854-59	 During this period, European public spaces were added. Cottages instead of barracks were assigned to two bachelors or to married officers. Higher rents were collected from these cottages. The ventilation design was typical to that done in Britain. (<i>Bear, Chapter 3: Governing the Railway Family</i>, 1860-1900. 2007)
1857	After the First War of Independence in 1857, the design of the Indian Railway stations changed from a place of commerce to a defensible structure, to provide refuge to British officers and families at times of civil war. Design recommendations were approved by the Lieutenant Governor of Bengal J.P. Grant, and subsequently became the standard design norm (<i>Bear, Chapter 2: An Indian Traveling Public,1850-1900. 2007</i>).
1859	 To make Railway stations more defensible, Viceroy of India Lord Canning ruled three principles to be mandatory for construction of Railway stations: All Railway stations to primarily allow traffic movement but no facilities that lower the speed or impair movement to be allowed. Building to be provided with simple and inexpensive facilities. All Railway stations' plans to be reviewed by the Government of India for traffic and defence compliances. Features of a defensible Railway station: Defensive ditches in front of the six-foot enclosing wall with iron spikes on top. Flat roofed buildings with kypes (Old English; also written as <i>keeps</i> fortified tower or enclosure) to afford cross and flanking fire. Location of new stations to be such that they fulfil emergency and military functions. Existing stations be upgraded by constructing sheltered communications between buildings, and keeps/towers be added to existing structures. Loopholes and palisading gates across the Railways, with sufficiently large openings to allow the trains running in and out - and capable of being closed by a proper loop-holed gate - were added to the proposed tower and iron <i>chevaux de frise</i> (row of spikes or broken glass set as an obstacle on top of a wall). Aesthetics of an Indian Railway station to convey an impression of safety.
1860	 Provision of passenger amenities such as toilets, lights, etc. were first introduced in the first-class carriages, and then the lower classes. (<i>IRFCA - Indian Railways Fan Club, 2010-2019</i>) Leisure facilities were provided in the form of Railway institutes and swimming pools for recreation, and to prevent alcoholism. (<i>Bear, Chapter 3: Governing the Railway Family, 1860-1900. 2007</i>)
1865	 There was a conscious shift in design sensibility and approach to Station design to retrieve public interest in the Station. (<i>Bear, Chapter Two: An Indian Traveling Public,1850-1900. 2007</i>) Institutes like the Lahore Railway Mechanics Institute were constructed along large Stations to keep the subordinates' staff healthy and engaged and prevent social issues related to idleness and loitering in public spaces of a Railway colony (<i>Bear, Chapter 3: Governing the Railway Family,1860-1900. 2007</i>)

Date	Design and Layout Characteristics					
1867	Hill sanitarium for recuperation was established for subordinate staff of the East Indian Railway at Landour, and other places that were climatically similar to Britain (<i>Bear, Chapter 3: Governing the Railway Family</i> .1860-1900. 2007)					
1850-1890	• Trains became a levelling public space, creating new forces and social reversals that catalyzed growth of civic life, and synergized associations that formed the basis for joint stock companies.					
	 Railway accidents became a symptom of the potential crises of capitalism. Equities were created as a measurable and insurable buffer against such hazards. Station architecture and waiting rooms were the transition between trains (an industrial 					
	 space) and the city Technological and commercial spaces emerged, and traditional domestic railway carriages were added. 					
	 Lock-ups and military outposts were built to the Stations. (Bear, Chapter 2: An Indian Traveling Public, 1850-1900. 2007) 					
1866-68	 Defensive features became standard inclusions to Railway station architecture, especially in cantonment towns like Ranchi, Jabalpur, Allahabad et al. Intimidating and confrontational effects of defensive features were reduced by providing 					
	recreational spaces, and a new architectural style emerged – e.g., Allahabad Railway station, which was an extension of East India Railway (EIR).					
	 Public facades of small and medium size Stations started including local (Indian) architectural features reminiscent of mosques, palaces and temples e.g., incorporation of domes in EIR Lucknow station. Bigger stations – e.g., Madras (1868) and Howrah (1890) 					
	were European, primarily Victorian Gothic and Italian in nature (Bear, Chapter Two: An Indian Traveling Public,1850-1900. 2007).					
1869	In 1869s, lock-ups were constructed in Railway stations to confine Eurasian and European passengers who were found to be vagrants or inebriated (Bear, Chapter Two: An Indian Traveling Public 1850 1000, 2007)					
1874	 Sanitary Police was introduced in EIR Colonies for enforcement of sanitary regulation. Security of settlement was made against encroachment of bazaars, worker colonies et al. When bazaars came too close to the Railway colonies, land was purchased to create a sanitary zone around the settlement. 					
	• Employees were encouraged to remove all native vegetations around their residences, and plant imported seeds to reproduce British sceneries, life and morals (Bear, Chapter Three: Governing the Railway Family 1860-1900, 2007)					
1876	 The following spaces were included as facilities in Railway estates: Brick houses Institutes Schools Recreational 					
	○ Gardens ○ Libraries ○ Cooperative stores grounds ○ Hospitals ○ Churches ○ Billiard rooms ○ Refreshment rooms					
	 Swimming pools Elementary and higher-level boarding schools of Railways were added in Barrackpore, Rampur, Howrah, Patna, Jabalpur and Danapur (<i>old name Dinapore</i>). (<i>Bear, Chapter 3:</i> <i>Governing the Railway Family</i>,1860-1900. 2007) 					
1878 -	Huts with courtyard and screen walls were introduced at Railway stations for Indian Station masters					
1887	• Space was also allotted to workers to construct their own huts (<i>Bear, Chapter 3: Governing the Railway Family</i> , 1860-1900. 2007).					
1890	In the 1890s, during the plague, Railway platforms became control sites (<i>Bear, Chapter 2: An Indian Traveling Public</i> ,1850-1900. 2007)					
	1900-1947					
	 Public spaces of the Railway suil maintained the distinction between Indian society and the Imperialists. Segregated serais (waiting and retiring rooms) were built in most of the maior stations for 					
	 Segregated service watting and rearing rooms) were built in most of the major stations for Hindus and Muslims. Separate retiring rooms for women next to service were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations (<i>Bear</i>, Control of the Major Stations) were attached to the Stations) were attached to					

Date	Design and Layout Characteristics				
1928	In March 1928, ' <i>Faidamand Panchayat</i> ' (Welfare Council) were formed in all the divisions of EIR to address matters of general interest, complaints and grievances. (<i>Bear, Chapter 5: An Economy of Suffering, The Ethics of Popular Nationalism in Petitions from Railway Workers</i> , 1930-1947, 2007)				
	1947-2019				
	 Large and improved waiting sheds were constructed to increase the comfort and convenience of third-class passengers, in the first quarter of the 20th century. At important passenger stations, the height of platforms was lowered (Khosla 1988). A minimum standard of amenities was laid down for every station for a period of 30 years: 				
	 Waiting hall Pucca platform surface Benches Shady trees on platforms Improved latrines Adequate illumination Drinking water Booking facilities Retiring rooms for third-class passengers in 1954 (Khosla 1988). 				
	• Segregated entrances and exits for upper class passengers were dismantled. (<i>Khosla 1988</i>)				

2.2.2. Types of RHA and HA associated with Railway System

(*Table 6: Distribution of immovable Railway Heritage Asset and Heritage Asset in Station and Station Area*) is a list of immovable and Associated RHA and HA that were, and continue to be, an integral part of the Railway system. Such Assets are likely to be found as a part of the Railway station, Station Area and Historic Environment. They show the interdependence of a city with the Station – and together comprise the value of Railway Heritage. Moreover, the density and diversity of RHA may also be used as an indicator of importance of a Railway station and Station Area - and also be used as a ready catchment that can be productively leveraged. (*Table 6: Distribution of immovable Railway Heritage Asset and Heritage Asset in Station and Station Area*) shall be used to establish a Statement of significance, Define the scope of work, and possibly Converge with local area planning for a holistic presentation of Heritage Asset.

Table 5: Distribution of immovable Railway Heritage Asset and Heritage Asset in Station and Station Area

R	Railway HA (Assets related to Railway operations and services. These are owned by the Railways)	HA	that	supported, or drew support, from the Railway System
A -′	1 - Operational Areas	B-1-	- Su	rrounding uses and infrastructure
1.	Station buildings with amenities for Officer, including	1.	Со	mmercial uses:
	retiring rooms for Officers		a)	Mall, Bazaars, City and Wholesale
2.	Offices for Railways functioning administration			markets and Cooperative stores
	including those for Security, Archives and Record		b)	Guest houses, Hotels, Hostels
	Room, Vaults, Signaling,		c)	Refreshment room and
3.	Railway Workshops, Depots and Sheds, including			Restaurants
	areas with Turntables and Sick Lines, Coach Parking	2.	Re	sidential areas
4.	Railway (and Shipping) yards	3.	Ga	teways/city gateways
5.	Goods shed, Warehouses and Platform	4.	Ins	titutional use
6.	Railway mail service area, Post Office, tunnel and		a)	Institute
	supporting facilities		b)	Libraries
7.	Parcel platform, siding, Terminal and		c)	Schools, colleges and Universities
	office	5.	Pu	blic and semipublic
8.	Godowns, Store Depot and Store Houses.		a)	Government and Private offices
A-2	2 - Non-Operational Assets]	b)	Courts
1.	Railway Institutes for Training and Engineering]	c)	Post office or General Post office
	colleges, Schools, Hospitals, Sanitarium		d)	Banks and Stock companies

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Railway HA (Assets related to Railway operations and services. These are owned by the Railways)	HA that supported, or drew support, from the Railway System
 Railway Printing press Railway officer's club, Rest and Guest houses Security infrastructure including Railway Protection Force post, Military outposts, Jail and lockups, Railway-volunteers ground Official liquor shops Serais, Guest houses and Yatri Nivas Supporting infrastructure like Railway Stable, Railway water tank, Canals Masonic lodges, Churches, Cemetery Sports tracks and arena/ stadium, Swimming baths, Gymkhana 	 e) Hospitals, Sanitarium 6. Religious: Churches, Temples, Mosques, etc. 7. Water Infrastructure: a) Ghats b) Canals c) Dyke (for flood control) d) Embankments e) Water tanks 8. Industries: a) Workshop for wagon and rolling stock manufacturing b) Shin manifacturing
 Recreation and supporting amenities including Theatre, Cinema hall, Library, Reading room, Grounds, Gardens, Bakeries Railway housing colony, Barracks, Cottages A-3 - Passenger Accessible Station Area 	 b) Ship repair, engineering, dock and yards c) Powerhouses d) Godowns, Warehouses and Store depots
 Booking office and facilities for tourists Pucca platform Waiting hall or shed Man's and Women's waiting room, Retiring rooms, sleeping accommodation Benches, Drinking water, Refreshment stalls, Eateries Cloak room A.H. Wheeler Kiosks Railway Museum 	 e) Jute mills f) Oil refineries 9. Public spaces and recreation a) Gardens and Parks b) Recreational fair or mela, Circus grounds c) Racecourse, Gymkhana and Swimming baths 10. Defense and security:
 A-4 - Transportation 1. Railway jetty, port, steamer services 2. Subways 3. Railway bridges 4. Under passes and Subways 5. Station roads 6. Subways 7. Tunnels 	 a) Military or cantonment areas b) Barracks c) Sepoy and Police lines 11. Transportation: a) Bridges, Tunnels, Subways b) Passenger and Goods (import and export) jetty, Ferry transport c) Bus terminus and Bus stop d) Tramways and Tram terminus e) Tonga services

Section 2.3: Categorizing of Railway Stations and Station Areas (for Field Work)

A sample of 40 Railway stations representing diversity and complexity of Station design, Function and Station Area Layout were selected from (Table 2: Dating Railway Stations selected for Redevelopment). These were then compared to identify six (6) cases that had shown maximum iteration -- and hence selected for case studies. The selected Railway stations were Howrah, Dibrugarh (Town), Jodhpur, Shimla, Egmore (Chennai) and Thiruvananthapuram (cells marked in green). Refer to *Table 7: Categorization and Comparison of Railway Station Areas* for categorization and comparison of Railway stations and Station Areas, and Appendix I for Case Studies.

Table 6: Categorization and	I Comparison	of Railway Station Areas
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Legend															
		Risk Types													
1 - Montane4 - Tropical W2 -Humid Subtropical5 - Semi-Arid3 -Tropical Wet and Dry6 - Arid								F - Flood C - Cyclone E(n) - Earthquake, where (n) = Intensity zone LS - Landslide						= Intensity	
'A, A1' Railway stations' classification based on revenue potential.															
				I	Func	tion	of Sta	tion		Ge	ogra Clin	phy a nate	and	Types of Risk	
S. No.	Station Name	Time- line	Junction	Halt	Terminal	Port	Goods (G)/ Passenger (P)	A, A1	Narrow (N)/ Broad (B)/Metre (M) Gauge	Mountain/Elevated	Coastal	Plain	Desert	Natural/ Man-made risks	
1	Howrah	1854	Y		Y	Y	Р	A1	В, <i>М</i>			3		E(III), C, F	
2	Allahabad	1859	Y				Р	A1	В			2		E(II)	
3	Kanpur Central	1859- 1930	Y				Р	A1	В					E(III), F	
4	Amritsar	1862	Y				Р	A1	В			2		E(IV), F	
5	Sealdah	1862	Y		Y		Р	A1	В			3		E(III), C, F	
6	Mughalsarai	1862	Y				Р	A1	В			2		E(III)	
7	Delhi Jn. (Old Delhi)	1864	Y				Р	A1	В, <i>М</i>			5		E(IV), F	
8	Nagpur	1867	Y				P, G	A1	B, N			3		E(II)	
9	Mysore	1870	Y				Р	Α	В			5		E(II)	
10	Secundrabad	1874	Y		Y		Р	A1	В			3		E(II)	
11	Dibrugarh Town	1883	Y		Y		Р	A	В			3		E(V), F, LS	
12	Jodhpur	1882- 1885	Y				Р	A1	<i>М</i> , В				6	E(II)	
13	CST	1878- 1888			Y	Y	P, G	A1	В		3			E(III), C	
14	Marmagao*	1888				Y	Р		В		4			E(III), C	
15	Morbi	1890					P, G		В			5		E(III)	
16	Tenali	1899	Y				Р	Α	В		3			E(III), C, F	
17	Barog	1901		Y			Р		N	2				E(IV), LS	
18	Shimla	1903			Y		Р		N	2				E(IV), LS	
19	Hospet	1905	Y				Р	Α	В			5		E(II)	
20	Chennai Egmore	1905			Y		Р	A1	В		3		E(III), C		
21	Hyderabad	1907			Y		Р	A1	В			3		E(II)	
22	Ranchi	1908	Y				Р	A	В			2		E(II)	
23	Bhopal Jn.	1884- 1910	Y				Р	A1	В			2		E(II)	
24	Tatanagar Jamshedpur	1910	Y				Р	A1	В			2		E(II)	
25	Lucknow Jn.	1914	Y				Р	A1	В			2		E(III), F	
26	Jaisalmer	1921			Y		Р	A1	В				6	E(III)	
27	Pune Jn.	1858- 1925	Y				Р	A1	В			3		E(III)	

28	Thiruvananthapur am	1931	Y		Y		Р	A1	В, <i>М</i>		4	E(III), C, F
29	Bareilly	1964	Y				Р	A1	В		2	E(IV), F
30	Bangalore City	1992	Y				Р	A1	В		5	E(II)
31	Udupi	1993					Р		В		2	E(III)
32	Khidirpur	1995		Y		Y	G		В		3	E(III), C
33	Shalimar (Shibpur)	2000			Y		P, G	A	В		3	E(III)
34	Jabalpur	1852- 1867	Y				Р	A1	В		2	E(III)
35	Surat	1852-60					Р	A1	В		5	E(III), C
36	Gwalior	1881- 1909	Y				Р	A1	B, N		5	E(II)
37	Digboi	1882- 1900					P, G		В		3	E(V)
38	Lower Haflong	1882- 1900					P, G*		В	3		E(V), LS
39	Chanakyapuri Delhi						Р				5	E(IV)
40	Garden Reach				Y	Y	G				3	E(III), C

Chapter 3: Field Work and Case Studies

Section 3.1: Field Work

From forty (40) Railway Stations (see *Table 7: Categorization and Comparison of Railway Station Areas*), six (6) were selected for field work undertaken to know (i) the properties of the Station and Station Area, and (ii) to identify the kinds of studies needed for Commercial Development of Railway Stations and Station Areas. The parameters were:

- Qualification of and correlation between Railway Heritage Asset (RHA), Heritage Asset (HA).
- Architectonics of Railway station and Station Area.
- Quality of maintenance, management, and State of Conservation of RHA.
- Existing urban management challenges affecting RHA, HA and overall user experience.
- Prospects of future upgradation.
- Kinds of studies required to be undertaken to enable Upgradation and Redevelopment work.

Table 7: Key Observations from Field Work and Pointers for Working Policy and Guidelines

Field Observation	Applications in Working Policy and						
Field Observation	Guidelines						
3.1.1 Site and Area Level Observations	5						
i. Station Siting							
Most stations built before 1870, were under the Old Guarantee System, and were located pursuing strategic interest i.e. either convenient transfer of goods or military movement or both, and besides technological viability.	All Railway Station had a network, that ranged from international to local scale that are integral to establish the socio-economic value, and the net worth of a Station and Station Area.						
Railway stations built after 1870s were construction and management by the State, were financed through New Guarantee System, and were sited based on returns from investments.	This is a tool to capture the evolution of the network, assess the feasibility, define a productive catchment for Land Value Capture and develop a Grade for the Stations and Station areas, in harmony with Ministry of Railways` recent classification of Stations.						
ii. Land Value Capture							
Station siting has always capitalized from resources in its context and from developing an ecosystem of services at adjoining areas and settlements.	Project planning shall include the existing and prospective ecosystem of services in value creation.						
Stations also added assets like canals, lakes, wetlands, salt mines, ghats etc. to make them accessible.	Irrespective of ownership, Policy and Guidelines dedicated to assets that are a part of the ecosystem, are required. This is essential for complete Land Value Capture.						
iii. Evolution of Context							
Station Precincts are characteristically Mixed-Use and High-density areas with affordable guesthouses, and extended facilities supporting Railway and commercial Land Use of different	The Working Policy and Guidelines for Railway Heritage Assets should factor in the inherent evolutionary nature of Station Precincts.						
scales.	The approach to Working Policy and						
Precincts, in most cases, developed into high footfall zones having transit modes (with or without facilities) that connect the Railway station to the region.	Guidelines for Railway Heritage Assets, shall facilitate changes without compromising integrity of Historic properties. So, it shall be a tool to standardize technically correct practices and not control and avoid future growth.						
IV. Building and Land Use in and around the Station Precinct							

Field Observation	Applications in Working Policy and Guidelines					
Station Building and Area had diverse Building and Land Uses, depending on the initial prospecting of the Station Land in the mid-19th century, and later revised via master planning exercises. All Railway Station Precincts studied as part of this assignment have been found to be of Mixed-Use	All Railway Station Precincts have to be planned for optimized high density mixed-use. Working Policy and Guidelines for Railway Heritage Assets shall provide objective tools to assess Impact of proposed development, regulate Indicators that bear impact and, most					
nature, with a very high frequency of change.	importantly, adopt an Avoided Impact method to develop compatible and adaptive project proposals.					
v. Public Spaces						
 Most large and medium Railway stations were provided with designed public spaces attached to the Station Building. This design element was a typical part of large public (assembly) buildings of the 18th -19th century. These were intended to provide an accentuated (public) frontage, and hence present the building to the public at-large. As an interface between the Railway station and the city, such public spaces were multipurpose in nature, viz.: Directed towards amenities such as inns, lodges, <i>serais</i>, hotels, transit hubs; Provided for city-level recreational space; Allowed spill-over, and hence increased effective capacity of the Railway station and viability of its Precinct; Assisted crowd management; and At times of disaster, allowed congregation and distribution of aid. Most of such spaces have been converted into parking areas, or transformed into carriageways. The faw that remain are provided at a provide and accented into parking areas. 	Reclaiming, protecting and preventing conversion of public spaces abutting Railway Stations shall be mandatory. Public spaces within Railway Land shall be without boundary walls. The planned active and passive use shall be such that the public space can still accommodate spill over from Station premises, and assist in crowd and disaster management.					
have been encroached upon.						
vi. Road Network, Public Transport and Mult	i Modal Integration					
Stations were sited at locations where important routes converged. The network responded to fluctuating demands of the Railway services, accessibility and availability of public transport, anner of transport planning and traffic management of the city and Station Area, and the effect of introduction of airports.	Management of connectivity is critical for Land Value Capture and for Station Areas, together to provide necessary user experience. Measures to manage shall range from reducing congestion to demand management and shifting focus from vehicular movement towards mobility					
It has resulted in high congestion and in certain cases isolated the Railway station and Station Area, creating thoroughfares wedged between the city and the Railway.	lowards modility.					
The routing of traffic and the manner in which public transport has been facilitated or the lack thereof - - has significantly affected Station Area management, user experience and usability.						

3.1.2 Building Level Observations These are observations directly related to Conservation and Management of RHA. **Application in Policy and Guidelines** Site Observations i. Building Information No documentation system and guidelines for To ensure inconsistency in quality of work and managing building information were shared sensitivity in approaching Historic Stations, officially. Hence, its gualitative assessment has Station Areas and its moveable asset, not been undertaken². To substitute this gap, a Maintenance, upgradation work, allocation of study was conducted of the on-going consultancy new infrastructure et al, are done with little processes, and the State of Conservation of consideration to Heritage. Technically sound Railway stations and station Area. Conservation of moveable heritage is also required. ii. Standardizing Assessments, Maintenance, and Management The Railway Charter provides a general direction The Policy and Guidelines shall: on what should be done with the 24 structures and 10 bridges that are listed to be protected. But • generate a Graded Set of Standards application of the criteria that distinguishes the applicable to protected and unprotected listed properties would put more than 70% of all Historic Assets; Indian Railway stations in the list of Heritage • standardize the Sequence and Quality of Stations in Continued Use (Table 2: Dating Procedures to be followed; Railway Stations selected for Redevelopment). standardize Skills required for Conservation; and A survey of the existing rules, norms and • provide Standard Protocols to identify regulations for execution of work shows that very compatible and adaptive reuse. little detail of the technical procedures get recorded in the maintenance, repair, inspection and monitoring process. The field survey corroborates these observations - demonstrated by the lack of consistency in the quality of maintenance, state of Conservation, and that of retrofitting and upgradation of the Railway stations. iii. Gaps in Existing Regulations and Norms Existing norms applicable to RHA have a 'control' The Policy and Guidelines shall take into bias. These norms are intended to preserve HA cognizance that the intent is to continue use, or as monuments. It does not, however, provide adaptively reuse, of the Historic Asset. Hence, technical standards or directives based on which the control shall be restricted to Quality of action, Asset owners may self-regulate and learn to Adherence to procedures and Monitoring of reuse Historic structures. impacts -- thereby following Avoided Impact Protocol. The norms applicable to city level HA are based on 'control of development' -- and do not provide RHA preservation and change of use to a nonfor a guided use/reuse in the future. It leaves designated class may be an option in exceptional circumstances. The Policy and comparability as an open-ended and subjective Guidelines are required to define the parameters decision, without providing for its technical

and

technicalities involved

upgrading to non-designed use.

in changing/

standards and limiting conditions.

² The Shimla Railway station, a World Heritage Property, has recently been upgraded. However, without an access to pre-project documentations, proposals and record of state after implementation, it is difficult to deduce and generalise norms or standards from this project.

Section 3.2: Appraisal of Existing Laws and Norms

Existing norms and laws applicable to Heritage resources are broadly of two categories:

- i. Those applicable entirely and exclusively for Heritage Assets (Table 9: Comparative Summary of Laws Applicable to Heritage Protection).
- ii. Those applicable to town planning and municipal corporations' Regulations and By-Laws with a mandate for interface and balance between Heritage and urban development (Table 10: Comparative Summary Appraisal of Local Heritage Protection Norms of Selected Cities).

Provisions present and absent are marked as 'P' and 'A', respectively. The study validated that the documents discussed in Table 9 and 10 have a monument-centric 'control' bias, emphasizing more on minimizing development and sanitizing the area.

This appraisal excludes the cities of Jaipur and Ahmedabad because of their respective Bye-Laws – and the fact that they are World Heritage cities that are lived entities. Both have norms that focus on the continuity of existing functions and minimal changes. For all others. The RHA would require a system of protection and management that specifies the limits of change, and ways of transitioning to the future. Therefore, the nature of change required may not be immediately imagined here and now - but shall require a response, in the future, to the economic and contextual demands.

Also see Appendix II: Comparative study of National Norms, Acts and Laws applicable to Heritage protection and Appendix III: Comparative study of Heritage Protection Norms of Selected Cities.

S. No.	Provisions	UBBL 2016³	AMASR Act	Model Heritage Regulations, TCPO, MoUD India 2011
	Provisions present and absent are marked as 'P' and 'A'	, res	pective	ely
1	Institutional Framework	P	Α	A
2	Grading/Listing	P	Α	Р
3	Heritage Precincts	Α	Α	Р
4	Building Parameters and Control Guidelines			
	Setback (in m)			
	FSI			
	Ground coverage			
	Max. Permissible Height (in m)	Α	Α	A
	Parking	1		
	Built-Up Area Ratio			
	Basement			
5	Open Space Regulations	Α	Α	Α
6	Permissible Uses	Α	Α	Α
7	General Guidelines for development/redevelopment/repairs etc. wit Asset/ Building:	thin t	he Her	itage Area/ Precinct/
	Urban structure			
	Urban grain			
	Scale	A	A	A
	Parking	1		

Table 8: Comparative Summary of Laws Applicable to Heritage Protection

³ While the UBBL 2016 is applicable for Delhi, it has been studied as part of National Norms, as it has been referred to by most other Norms/Byelaws. Even the Model Building Byelaws of Delhi refer to UBBL 2016.

S. No.	Provisions	UBBL 2016 ³	AMASR Act	Model Heritage Regulations, TCPO, MoUD India 2011
	Provisions present and absent are marked as 'P' and 'A'	, res	pective	ly
	Materials and Detailing			
	Landscape			
	Views and Landmarks			
	Historical Development			
	Signage Design and Controls	Р		Р
	Skyline	Р		Р
	Others	Р		Р
8	Architectural Control Guidelines	Α	Α	Α
9	New construction/ Development/ Re-Development/ Addition/ Alterations or Extensions to Existing Structure	Р	А	Р
10	Prohibited Area	Α	Р	Α
11	Regulated Area	Α	Р	Α
12	Demolition of Heritage Building	Р	Α	Α
13	Repairing	Α	Α	Α
14	Selling or leasing out of the Heritage Property	Р	Α	Α
15	Change of Use of Heritage Building	Α	Α	Α
16	Maintenance of Heritage Building	Α	Α	Α
17	Inventory and Mapping	Α	Α	Α
18	Others			
	Heritage Byelaw		Р	
	Development Permission for Heritage Precincts/Natural Feature			Р
	Restrictive Covenants	Р		Р
	Alteration/Modification/Relaxation in Development Norms	Р		Р
19	Taking over Management and Control of Heritage Building	Α	Α	Α
20	Penalties	Ρ	Р	Р
21	Incentives	Ρ	Р	Р
22	Owner's Responsibility	Ρ	Α	Р
23	Mechanism for sanction	Α	Р	Α

S. No	Provisions	Jaipur	Ahmedabad	Mumbai	Kolkata	Howrah	Chandigarh	Nagpur
	Provisions present and absent are marked as 'P' an	nd ' A ',	resp	ectiv	ely	1		
1	Institutional Framework	P	P	Р	P	P	P	Α
2	Grading/Listing	P	A	P	P	P	P	Р
3	Building Parameters and Control Guidelines		D					
		P	P					
	FSI Cround coverage	A	A					
	Ground coverage	P	P					•
	Max. Permissible Height (In m)	P	P	A	A	A		A
	Parking Duith University Definition	P	Р				A	
	Built-Up area Ratio	P	A					
	Basement	Р	P					
4	Open Space Regulations	A	P	A	A	A		A
5	Permissible Uses	A	P	A	A	A		A
6	General Guidelines for development/ redevelopment/repairs etc Asset/ Building	. withir	n the	Heri	tage	Area	/ Pre	cinct/
	Urban structure							
	Urban grain				Δ			
	Scale							
	Parking	P		Δ				
	Materials and Detailing		Δ		Р	Δ		
	Landscape							
	Views and Landmarks				A			
	Historical Development							
	Signage Design and Controls	Α		Р	Р			Р
	Skyline	Α		Ρ	Α			Р
7	Architectural Control Guidelines	Р	Α	Α	Α	Α		Α
8	New construction/ Development/ Redevelopment/ Addition/	Р	Р	Р	Р	Α		Р
	Alterations or Extensions to existing Structure							
9	Prohibited area	Р	A	A	A	A		A
10	Regulated area	A	A	A	A	A		A
11	Demolition of Heritage Building	A	A	A	P	A		A
12		Р	A	A	Р	A		A
13	Selling or leasing out of the Heritage Property	A	A	A	Р	P		A
14	Change of use of Heritage Building	A	A	Α	P	A		A
15	Maintenance of Heritage Building	P	A	A	P	P		A
16	Inventory and Mapping	P	A	Α	P	A		Α
17	Others							
	Heritage Databank	P						
	Heritage Conservation Plan		Р					
	Requirements of Sites			Р				
	Development Plan Reservation			Р				
	Relaxation in Building and other requirements			P				

S. No	Provisions	Jaipur	Ahmedabad	Mumbai	Kolkata	Howrah	Chandigarh	Nagpur
	Restrictive Covenants	iu A,	lesh	ecuv	eiy			P
	Power to alter modify or relay other Development Control							-
	Regulations:							Р
18	Taking over Management and Control of Heritage Building	Α	Α	Α	Р	Р		Α
19	Penalties	Р	Р	Α	Р	Р		Р
20	Incentives	Р	Р	Р	Ρ	Р		Р
21	Owner's Responsibility	Р	Α	Α	Р	Р		Р
22	Mechanism for sanction	Р	Р	Ρ	Α	Α		Р

Section 3.3: Summary of Case Studies

(*Table 11: Summary of Case Studies*) summarizes case studies focusing on how Heritage Assets are being managed, upgraded and adaptively reused. Special focus is given to study of railway systems -- and how these have either been upgraded, or those ceasing service have been repurposed, to suit contemporary life. To understand how these projects have been achieved, their enabling Norms, Laws, Standards and Procedures followed were studied. The list of documents studied are included in *Index (III)*.

Table 10:	Summary	of Case	Studies
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S. No.	What has been done	Why adapt	What could be adapted
1.	 Air Rights Development (ARD) or Overbuild (Goldschmidt, 1964) Historically, ARD has mostly occurred over the Railways and highways in North America due to the central location of the transportation routes, where high Land Values justify the added economic costs of ARD (Lillie, 1964) No land is required for new developments, but 'under-utilized' densities can be utilized for new developments, especially in high-density areas where land is more of a premium or where developable land is unavailable. 		
a.	Railroad (New York Central; Cleveland Union Terminal Co.; Chicago and North Western; Ill. Central, Chicago; N.Y. Central; Southern Pacific; Long Island; Chicago and North Western; Pennsylvania Station; Illinois Central)		
	 Air rights for built spaces over Rails, Railway related structures, or car parks. New York Central's tracks, which were once surrounded by semi-slums, were covered by a platform and the Right of Way was transformed into one of the most admired pieces of real estate in the world. Illinois permits railroads, which have right over revenue collected from real 	 Preserving Green Space. Integrating Land Use and transportation. Mixing Land Uses. Fully utilizing existing urban land and infrastructure. Ensuring compact building design. Providing transportation options; and Directing development within existing areas. 	 The leasing, with options to renew, of air space and land necessary for foundations by the owner to the developer. The conveyance of the entire fee of land and air space to the developer, with an easement reserved to continue the surface use. The conveyance of the fee to the air space and support areas. Check prior to overbuilding: Structural stability of existing Assets; Potential disturbances

S. No.	What has been done	Why adapt	What could be adapted
	estate, to sell or lease the air rights for further development. This is provided such developments do not interfere with Railway operations.	 Provides financial incentives to owners of Assets. 	 (acoustic, vibration, circulation etc.) to the new development; and Safety, security and access. Impact to Historic structural and visual-aesthetic integrity to be assessed. New developments can be in the form of structures or car parks i.e., public utility Green spaces as overbuild.
b.	Earl's Court Regeneration Pla	an, London	
	 Regenerating the 32- hectare Earl's Court site involved creating four new distinct urban villages, Including community amenities, retail, workspace, offices, hotels, health, and leisure. 	 Facilitate the potential to create a highly walkable and cyclable environment, Generation of a forecasted 10,000 new jobs. 	• Off-site pedestrian improvements as part of a comprehensive public realm strategy for the surrounding area.
C.	Principal Place, Shoreditch, L	ondon	
	• Mixed-use development that includes a 60,000 sq. m. contemporary office building, and a 50-storey residential tower connected to a public piazza built on a steel grillage over the 28.5m-wide, 7m-deep open Railway cutting.	 Placing foundations or supports in the very limited space between the Rail tracks. A column of the 15-storey commercial building supported on steelwork, cantilevered over the Rail tracks. 	Structural design solutions.
d.	Royal Mint Gardens, Tower H	lill, London	
	• High-quality residential units and communal amenity spaces, articulated by new public spaces, communal roof terraces and courtyards.	 Development maximizes the site's high and low- level Docklands Light Rail (DLR) lines and cantilevers over viaducts of another Rail line. Spaces within the viaducts utilized. 	 Use of Transfer structures, Meeting the requisite vibration and noise isolation standards covering Rail box containment and acoustically isolated foundations.
e.	Riverside South, New York		
	 Largest-ever all-residential development, covering 30 hectares of defunct Rail yards, Comprising 5,700 apartments spread over 16 buildings of 15-49 storey, 3,500 parking places under the buildings, retail space, parkland and rejuvenated highway and public transportation facilities. 	 Dense residential development required decking overactive Railroad tracks, Pre-stressed, precast concrete planks used to span the Rail tracks, supported at either end by 600-mm thick reinforced-concrete crash walls, Loads from the apartment blocks are borne by 1,200 to 	 Structural design solutions, Pre-stressed, precast concrete planks, Rejuvenated highway and public transportation facilities, Decking of residential units over active Railroad tracks.

S. No.	What has been done	Why adapt	What could be adapted
		1,800-mm deep transfer beams.	
2.	Biodiversity Offsets (IUCN (NSW Department of Plannin	2016) (NSW Department of Plan g, Industry and Environment 201	nning, Industry and Environment n.d.) 7)
a.	New South Wales		
	Biodiversity Offsets are designed to give biodiversity the gain to compensate for residual losses i.e., it is a policy approach that seeks to minimize the environmental impacts of a development project, by ensuring that any damage in one place is compensated somewhere else.	 Utilize undeveloped land owned by the Indian Railways. Undertake 'ecological development' of another area under the control of the Railways to compensate for environmental, cultural damages during development in one area 	 Redeemable 'points' for innovative and sensitive solutions – for Developers involved in Station Area Redevelopment projects. Sensitive solutions could be Salvage of material discarded by the Railways - such as sleepers, rails etc., Minimal demolitions, and Responsible disposal of construction waste, etc. Life cycle - sustainable management. 'No Net Loss' (NNL) and 'Net gain' (NG) approaches for Biodiversity use of targeted and measurable environmental goals.
3.	 Route Adaptation (Kapp 2019) (The Puffing Billy Railway n.d.) (Henley 2017) (Taiwan The Heart of Asia n.d.) (Cowling 2019) Paths are flat or gently sloping, making them easily accessible and helps enjoy the outdoors. Ideal for many types of activities depending on the rules established by the local community including walking, bicycling, wheelchair use, etc. 		
a.	Rails-to-Trails Conservancy		
	 Multipurpose public paths created from former Railroad corridors. Providing resources in the form of Trail planning, capacity-building grants, technical support, and best practices for rural, suburban and urban communities seeking to build trails and connect the trail systems. 	 Linking corridors across the country, Mobilizing trail supporters and public to advocate safe walking and biking infrastructure, Partnering with nationally respected organizations, Federal, state and local agencies, Public leaders and Trail advocates to build trails and educate. 	 Creating trail networks that connect people and places, bringing transformative benefits to all communities, Preservation of defunct Railroad corridors for continued public use.
b.	Puffing Billy Railway, Australi	a	
	 From the very outset, Victoria's Narrow Gauge Railways proved to be very uneconomical in operation and were plagued with continuing financial losses. In 1953, a landslide blocked the track, and because of operating losses the line 	• Everything that is part of the scene i.e., from locomotives and rolling stock to buildings, fencing, signs, furniture, etc., and even staff clothing is representative of the Railway, as it operated in the 'Era of Significance' where the aim is to take the visitor "back in time."	 Presentation of the Railway – 'Operating' or 'Living' museum. Employment generation.

S. No.	What has been done	Why adapt	What could be adapted
	 was officially closed in 1954. Puffing Billy Preservation Society, founded in 1955, provided a financial guarantee against loss to the Victorian Railways, which continued to operate the little train between Upper Ferntree Gully and Belgrave. 		
C.	Jiji Town Railway Tour Line, ⁻	Taiwan	
	 Built by the Japanese government in 1922 to transport timber and people to build the first hydroelectric plant in Taiwan, and then it was reinvented as a tourist Railway. The Station was destroyed in the 1921 Earthquake but later reconstructed and restored to its original look. Under the collaborative effort of the Railways Administration and Township Office in 1994, the small trains of the Jiji route were transformed into painted tourist trains. 	 Each train on the Jiji line is decorated with its own unique character set. The Rail station is a functional monument as it has been part of the contribution of the route to the regional economy. 	 Reuse as Heritage tourism route, Preservation of Railway stations along the route, Employment generation. Collaborative effort of Railway administration with state/town authorities.
4.	Adaptive Reuse - Change of Public Spaces 2002) (Contell	o f Uses (Erdoğan and Erdogan -Martínez Arquitectos 2017) (Th	2013) (Design Build n.d.) (Project for e Engine Shed n.d.)
a.	Tokyo Station, Marunochi, Ja	pan	
	 Renovation of the century old Railway station has revived some of the original glory of the sprawling, domed structure regarded as a central Tokyo architectural and historic masterpiece. Restored north and south- end rotundas, and revived the building's 3rd floor. Domed rotundas now retain their original look. The Tokyo Station Hotel was also renovated and reopened. Renovation cost was about ¥50 billion, but JR East 	 Station traffic increased about 40% in the opening week. Sales at restaurants logged 20% growth - more popular were those with views of the station. Renovation has turned the terminal area used merely as a transit point to a major tourism spot, attracting people from all over Tokyo, Japan and abroad. Now, people come to the Railway station for sightseeing, shopping and leisure. 	 Part change in use, suited to the commercial appeal of the site. Uniformity in structure facade of the Station Area. Not only renovated the historic redbrick building, but also the Yaesu side on the opposite side of the terminal.

S. No.	What has been done	Why adapt	What could be adapted
	recovered part cost by selling off air space to surrounding high-rise buildings to build higher floors.		
b.	Musée D'Orsay, Paris		
	 New spaces added to the main space by partitions, Roof was partially made transparent, and lateral naves turned into exhibition halls with double-sized height. Rooms of the hotel were added to the museum. Hotel's restaurant kept serving even after the Railway station being converted to a museum. 	 Rail Terminal building fell short in meeting the commuter demand post- 1939. After multiple changes in use, it was decided to re- designate the building as a museum which would contribute to the cultural development of Paris. 	 Low-interfering nature of museum function, Integrated support system to facilitate museum function, Supports academia, Need to have a long-term operating plan.
C.	Budapest Nyugati Railway Te	erminal	
	Budapest Nyugati Railway Terminal-to-McDonald's Fast Food, Budapest.	Terminal buildings were facing imminent demolition.	 Not an ideal example (McDonald's is junk food the association with zero-food also devalues the Rail station). Knee-jerk reaction to Heritage
d.	St. Louis Union Station		
	St. Louis Union Station-to- Hotel + Shopping Mall + Restaurants, St. Louis, Missouri.	Adaptation to a hotel was easier, since a part of the building was originally designed as a hotel.	No transfer in identity.
e.	Edirne Railway Terminal		
	 Edirne Railway Terminal to Presidency of Trakya University, Turkey. Due to changes in the function of the building, it has undergone numerous repairs. 	Present function is suitable for monumental characteristics of the building.	More or less a correct preference, as it is a public space.
f.	The Engine Shed, Stirling (So	cotland)	
	 The Engine Shed building, used as a goods transfer shed, was built sometime between 1896 and 1913 and was also a part of an important military complex. Historic Shed upgraded while disturbing as little as possible of the original 	 Serves as a central hub for Building and Conservation professionals, and the general public. Showcases contemporary use of traditional material with sympathetic design and construction. 	Scotland's dedicated Building Conservation Centre - inspiring future generations to continue to care for Scotland's built Heritage.

S. No.	What has been done	Why adapt	What could be adapted
	 fabric and character; Two new sheds built one on either side of the original structure providing extra space for the Conservation Centre. As part of the restoration, the floor has been taken down to the original level, and the rails and platforms removed. 		
5.	Effective Conservation Prin 2013) (ZUO n.d.) (Kings Cru McAslan + Partners 2012) (N	ciples (Benthem Crouwel Archi oss Team and Conservation ar ew York Transit Museum 2014 -	tects n.d.) (SSF Ingenieure n.d.) (UIC nd Urban Design Team 2004) (John 2017)
a.	Amsterdam Central, Netherla	nds	
	 Adding Metro stop and metro tunnel underneath the central tunnel of the Terminal train station; Removing bus stations from front to the back of the Railway station; Adding an underground tunnel for vehicle traffic, Adding paths for cyclists and pedestrians. Elevation of the Railway platforms to a height of 76cm ('<i>Program P76+'</i>). Construction of a new roof, tunnel and entrance hall on the river, Reclamation of 40m of land from the river. 	 Turning a typical 19th century Railway Architecture Terminal station to a 'through' station. Expansion and renovation of the 1889 Station Building increased passenger capacity 10 times. 	 Integrating National policy to benefit Station design. Restructuring the public transport system. Barrier-free passageways. Widening of historical Open Havenfront (harbour front) to emphasize the island character. Renovation of the historic Station Building restored its former glory, while new additions were clearly recognizable as contemporary.
b.	Dresden Central, Germany		
	Modern solutions chosen harmonize with the character of platform halls, where original design elements were missing.	Resulted in an overall concept which not only respects and emphasizes the old structure and the history of the Station - - but also integrates modern and innovative concepts that represents the development of Railway.	 Conservation principles and design strategies. Detailed documentation of the historic Railway.
c.	Saint-Lazare Station, Paris		
	• Widening passage from Railway station to Rue d'Amsterdam, and creation of a side entrance improving access and making the Station safer.	Rethinking inter-modality of the premise, and simplifying movement through the stations.	 Preservation and enhancing architectural Heritage by restoration of the building. Improved pedestrian flow in the Railway station. Routing Metro line as an additional interchange level component.

S. No.	What has been done	Why adapt	What could be adapted
	• Creation of 250 underground parking spaces, and retail spaces providing travellers and visitors with improved service and convenience.		
d.	King's Cross Central, London		
	 Orientation, solar shading, and use of thermal mass for cooling and passive ventilation systems. Water-saving and recycling technologies. Roofs planted with allotments, gardens and lawns. Office buildings designed to achieve environmental performance 40% greater than required regulations. Combined heat and power (CHP) engines makes conventional boilers redundant. Waste from public areas and buildings channeled through direct recycling. Incineration for energy from food waste and mixed waste. 	Streamlined planning and Heritage procedures.	 Planning policies integrated with Building Conservation. Energy efficiency techniques.
e.	Grand Central, New York		
	 Multiple repairs and renovations over the century. Now operates as a museum, exhibition centre, and market space. Use of ramps, rather than staircases, to conduct passengers and luggage through the facility. 	 The 1996 restoration generated over 2,000 construction-related jobs throughout New York State. World's 10th most visited tourist attraction, excluding train and subway passengers. Terminal's main concourse is often featured in movies and television shows. 	 More than just a Terminal a venue. City's crown jewel. Grand Central Terminal meets Americans with Disabilities Act (ADA) requirements.
6.	Using digital heritage technology (ARCADIS n.d.)		
a.	Manchester Victoria Station, United Kingdom		
	 Complete remodeling of the Metrolink infrastructure at Manchester Victoria station, to increase tram capacity. Pioneering use of BIM to collaborate and manage 	Using BIM helps in reduction of construction time.	BIM integration and data management.
S. No.	What has been done	Why adapt	What could be adapted
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	the supply-chain saving time and money during construction.		
8.	Railway Heritage related Pla	anning Policies (Parks Canada	2020) (RPS 2004) (Butcher 2010)
a.	Heritage Railway Stations Pro	otection Act, Canada	
	 Designation and protection of Heritage Railway stations and specific Heritage features under the Canada Transportation Act. No Railway company may, in any way, alter, demolish, or transfer ownership of a designated Heritage Railway station without the authorization of the Government of Canada. Violations of the Act are punishable by fines of \$ (Canadian) 50,000 to 1 million. 	 Limitations of the Act: Protection limited to Stations owned by federally licensed Railway companies. Does not extend to other historic Railway structures, such as 'Roundhouses'. Not mandatory for a Railway to maintain a property to Heritage Canada guidelines, or repair any damage. By inaction, a Railway can leave a Historic structure in ruins. 	• The effectiveness of the Heritage Railway Stations Protection Act ultimately depends on the Railway companies who manage and care for the stations daily, and on the private citizens who continue to express concern for the protection of these resources.
b.	King's Cross Central, London		
	 Planning policies aim at striking a balance between maximizing development opportunities given the 'brownfield' characteristics, central London location, and high level of public transport accessibility and of conserving and enhancing its Heritage and other environmental resources. Channel Tunnel Rail Link (CTRL) Act in 1996. 	 Comprehensive, phased, Mixed-Use development of former Railway Lands within the King's Cross Opportunity Area. Mixed-Use development of part of the former Railway Lands within the Camden King's Cross Opportunity Area and Islington Area of Opportunity. 	 Streamlined planning and Heritage procedures. Development framework drawing upon the historic features of the site to create a truly sustainable business and residential community, reliant on minimum use of cars.

Appendix I: Excerpts from Field Work at Howrah, Shimla and Egmore Railway Stations

Section 01 Howrah Railway Station

1.1 BEFORE THE ADVENT OF THE RAILWAYS

1.1.1 Pre-Railway Era (till 1832)

In AD 1713, the Bengal Council of East India Company (EIC) sent a deputation to Delhi, appealing to the Mughal Emperor Farrukshiyar to grant acquisition of some villages, and for trade. The requisiton was for Salkia (Salica), Howrah (Harirah), Kasundia (Cassundeah), Ramkrishnapur (Ramkrishnopoor), and Betor (Battar) to the west of river Bhagirathi. Once granted, the EIC immediately created exit and entry points which were seafaring business hubs, and this was the initiation of modernization of Howrah as we know today.



Map 1: Howrah Before 1832 - Pre-Railways

1.2 INCEPTION AND EXPANSION OF HOWARAH RAILWAYS

1.2.1 Railway Land, Line and Station (1847)

1845: Survey began in 1845.

1850: An initial survey from Howrah (across the river Hooghly from Calcutta) to Burdwan on the route to Raniganj Coalfields was carried out.

1852: East India Railway (EIR) occupied the land despite opposition of the British Government. The latter did not sanction the purchase of sufficient land nor the necessary waterfrontage, as they expect the Terminus to grow – and, thereby, its potentials.

The land purchased by the East India Railway (EIR) had an orphanage and a church of the Portuguese Missionaries. These were shifted to Calcutta and the Company built a makeshift arrangement with tin sheds to facilitate maintenance work, and Train Building Yard to initiate Railway operation. The leftover area to the north west was used for storage of materials, and subsequently became the storage depot of EIR.

1854: The first section (Howrah-Hooghly main line) and Hooghly – Pandooah Main Line opened in August. The first Railway Station Building was a structure of iron sheet roof and one platform. By 1850, several important routes converged. These routes connected producer areas with resources of interest to the EIC.

(*Map 1: Howrah Before 1832 - Pre-Railways*) shows the context in which the Howrah Station was established and the change in land use when the Station operation started (*Map 2: Howrah 1845–1852 - Railway Land, Line and Station*).



Map 2: Howrah 1845–1852 - Railway Land, Line and Station

Railway premises (as per 1847-1849 survey map)

1.2.2 Station and Station Line Expansion (1854-1890)

Expansion of Station Lines:

1855: Sheoraphuli – Tarakeswar Branch Line

1863: Azimganj – Nalhati Branch Line 1866: SBG Loop (Khana Jn. – Kiul Jn.)

1885: Bandel - Barddhaman Main Line





Howrah Station area	 – River Edge before 18
Heritage structure	Existing river edge
Water bodies	Store Depot
Burial ground	Company Dock
Railway premises (as per 18	347-1849 survey map)

1.2.3 Linkages, Interchange Nodes and Surroundings

Map 4: Howrah 1845-1890 - Linkages, Interchange Node



Prior to 1862 there was no bridge across the Bhagirathi, and passengers and goods were ferried over boats to and from the Railway station. Railway passengers were ferried to and from Armenian Ghat on the eastern bank by steamers. The ghat also had the only booking counter, which provided an integrated ticket that included the fare of crossing the river to arrive at the provisional Rail platform and the Railway journey.

There was a Railway pontoon instead of a landing ghat towards the Railway station. (*Map 4: Howrah 1845-1890 – Linkages, Interchange Node*) shows the stages of development of interchange points, nodes and linkages once the Station commenced operation. The increase in improved infrastructure, density of nodes and diversification of modes and business prospects indicate the impact Howrah Station had on the area after its operation.

1862: A feasibility study commissioned by the Governor of Bengal, was conducted to bridge either banks of the Hooghly River, but wasn't pursued further.

In 1865, another platform was added for arrival departure of trains separately.

1870: The Calcutta Port Trust was founded and entrusted, via the Howrah Bridge Act of 1871, with the construction and maintenance of the Bridge.

1874: A pontoon bridge was built by the Calcutta Port Trust to link Calcutta and Howrah, without disrupting the river traffic. Chandpal Ghat and Strand Road, along with the waterways and the pontoon bridge became the main interlinked access to Howrah station.

The Railway lines connected Howrah and Hooghly to Bali, Serampore and Chandernagar.

Opening of Howrah Railway Terminus, provided significant riverside economies for the growth of industries like jute mills, ship repair and engineering, wagon manufacturing units and dockyards. Chandpal and Strand road, waterways and bridge became main interlinked access to station.

1.2.4 Station and Station Line Expansion 1890-1945

1897-98: Howrah-Amta line was opened from Telkalghat to Kadamtala station. This line proved profitable and expanded the penetration of goods and passenger traffic. Laying of the circular Railway, connecting BBD Ghat and Majerhat, further enhanced the mobility and transfer of goods from port area to warehouses. Gradually, due to the silting of Hooghly and its inaccessibility to bigger ships, this line ceased functioning.

1901: Wagon manufacturing workshop set up by Burn and Co.

1901: Due to a great increase of traffic, a new station building was proposed. A new, larger Howrah Terminus station with six platforms and provision for four more constructed. Outside a long row of godowns has been erected for the enormous good traffic, especially in coal, wheat, rice and oil seeds which come to Howrah.

1905-1909: Howrah station was remodeled on the formation of a joint station with the Bengal-Nagpur Railway. A small branch line established connection with the Kidderpore docks via Shalimar.

From a single platform station, the Howrah Terminus now had six platforms, with provision for four more lines. Outside, a long row of godowns were constructed, evidencing the volume of goods traffic, especially in coal, wheat, rice and oil seeds which converged to Howrah.

(*Map 5: Howrah Station Expansion from 1890-1945* and *Map 6: Howrah Station - New Howrah Bridge and Tram Network*) shows the further increase of transport modes and other developments as a result of expansion in Railway operations.



Map 5: Howrah Station Expansion from 1890-1945

Source: (Sociological Map: City of Calcutta 1910) (Bartholomew 1909)

Howrah Station area Heritage structure Water bodies – River Edge before 1890s

- Existing river edge
- Railway station

1.2.5 New Howrah Bridge and Tram Network

1943: With operation of the Howrah bridge, Calcutta tramways extended its operations connecting Howrah with Calcutta with road transport. A tram terminus at Howrah station was constructed.



Map 6: Howrah Station - New Howrah Bridge and Tram Network

Source: (Sociological Map: City of Calcutta 1910) (Bartholomew 1909)

- River Edge before 1890s
- Existing river edge
- Howrah Station area
- Heritage structure
- Water bodies
- Railway station
- • Tram line

1.3 CHANGES and DEVELOPMENTS SINCE THE '70s

1.3.1 Linkages and Interchange Nodes



Map 7: Howrah - Present-day River Frontage

1970-71: Tram terminus at Howrah station was closed when the Howrah bridge was declared unfit to carry trams. Many vehicles and pedestrians began to traverse the tram tracks when the routes discontinued. The terminus station was converted to underpasses and a bus terminus.

1980-84: Circular Railway rehabilitated.

1980: Howrah station was expanded for the second time, by adding 8 platform tracks to the south of the station which previously had a parcels terminal. The track count then went upto 23. A new Yatri Niwas (transit passenger facility) was built to the south of the original Head House.

2006: Railway museum was established.

(*Map 7: Howrah - Present-day River Frontage*) and (*Map 8: Howrah - Present-day Surroundings*) shows how the area around the Railway Station became the centre point of regional trade and connectivity since the 1950's.

1.3.2 Station Surroundings





	Existing river edge	Howrah Station area
	Earlier river edge	Platforms
_	Railway track Tram line	Heritage structure
_	Station Cab roads	Water bodies
_	Main access roads to station	Open/green space
0	Bus interchange	1 / 8 1
0	Taxi/cab interchange	Taxi zone in front of station
\bigcirc	Ferry interchange	Uber booking zone
\circ	Tram interchange	-
\circ	IPT interchange	Parking (2 & 4-wheeler)

Section 02 Shimla Railway Station

2.1 BEFORE THE ADVENT OF THE RAILWAYS

2.1.1 Pre-Railway Era (till 1832)

1817: This forested area was surveyed for the first time. The settlement was close to the Jakhoo temple with a few scattered hutments.

1822-24: Captain Charles Pratt Kennedy, political officer to the Hill States, built Simla's (renamed Shimla) first pukka house, named the 'The Keneddy House'.

1828-29: Bentinck Castle was built by Lord Bentinck for his staff.

1830: Shimla developed as a major base for the British.

1834-40: Annadale ground was laid out. It was used for a Fancy Fair in 1839. In 1840, Annadale was converted into a Race Course.

Old or Staging road: Before the coming of the Railways, a route by foot connected Shimla with Kalka via Kasauli, Sanawar, Kakarhatti, Sairi and Jutogh. This road, shown in (Map 9: Shimla 1817-1840 - Pre-Railways), connected Mount Jakhoo and became Shimla's Mall, following almost the same alignment as today.



Source: (Buck 1904)

Forest area

1842: The retail or shopping area was located at the Ridge.

1844: A small one-storeyed house called the Tendril Cottage and the Dalzelle's Estate were built.

1845: Kali Bari Temple was built.

1847: The idea of a rail link to Shimla was presented by a correspondent of the Delhi Gazette for swift troop movement.

1848: Government Model Boys Senior Secondary School was built.

1856: Before the Railways, the mode of travel to the hills was by Jampans (a sedan with two poles), ponies or mules. With the construction of the Hindustan Tibet Road, bullock cart service for goods, and tonga service for mails and passengers, were introduced.

1863: Peter Hoff Mansion was built for Viceroys and Governor Generals.

1880: Bantony Castle was established.

(*Map 10: Shimla 1842-1880 - Pre-Railways - Development of Structures*) shows the increase in rate of development along the route.

Kali Bari temple Bantony Castle Dalzelle's Estate Towards To Mount Jakhoo Ridge Tendril Cottage Peterhoff Mansion To Kalka School Hindustan Tibet Road To Ambala To Tibet wherever station area lies in the vicinity of 0m 300m ural features like water streams or diverted eams, same will be mapped and marked on n Base map developed by Creative Footprints as per researc

Source: (Buck 1904)

Map 10: Shimla 1842-1880 - Pre-Railways - Development of Structures

Heritage structure Forest area

2.2 INCEPTION OF SHIMLA RAILWAYS

2.2.1 Survey and Start

1884-85: Kalka to Simla route of 68 miles surveyed. Recommendation of the two-foot gauge Rail track was set aside as the army found this unacceptable, and the standard hill Railways 30-inch Narrow Gauge was adopted. *Map 11: Shimla 1884-1902 - Survey of Land* shows the path that was surveyed before Railways were laid.

Construction of Army Headquarters began in 1882 and was completed by March 1885.

1890: Kaithu Jail was built.

1892: The largest and well-known Peliti Grand Hotel was built.

1897: Railway Board building was constructed.

1899: Construction of the Shimla Railway station initated.

1902: The Oberoi Cecil was built in 1902, restored and refurbished in 1997, and is now a prominent hotel of Shimla.



Map 11: Shimla 1884-1902 - Survey of Land

Heritage structure

Source: (Buck 1904)

Forest area

2.2.2 Kalka-Shimla Line

1903: The line was opened to public traffic, making Shimla more accessible. The Kalka-Shimla Railway led to continual technology transfers between Europe (Great Britain, Germany) to the Indian subcontinent. The arrival of the Rail line boosted business in Shimla, and goods could now be transferred conveniently. Annandale Race course was converted into the Gymkhana. The Mall, which was seemingly neglected, came to life with the influx of British officers and residents.

1904: Gorton Castle was built.

Map 12: Shimla 1903-1914 - Kalka-Shimla Railway, Map 13: Shimla 1915-1991 - Development and Changes, Map 14: Shimla – Present-day Linkages, Map 15: Shimla – Present-day Interchange Nodes and Map 16: Shimla – Present-day Surroundings shows the alignment of the Kalka-Shimla Line and range of development after its operation.



Map 12: Shimla 1903-1914 - Kalka-Shimla Railway

Railway track
 Shimla Railway Station
 Heritage structure
 Forest area

2.3 COMING OF THE RAILWAYS

2.3.1 Changes over Time

1915: Shimla Sanitarium and Hospital were built.

1921: Further additions were made to the Shimla station to accommodate new functions. The Crowborough Officers Rest House was built.

1925: Central Assembly Council Chamber (renamed Vidhan Sabha) was built.

1944: Due to heavy snowfall, the roof of the platform of the Shimla Railway Station collapsed. Sanction for converting the station into a double storey structure was granted.

1945: Construction and opening of Victory tunnel to the Railway station, and the main Bus stand, commenced. After Independence, the Peterhoff Building served as Punjab High Court.

1986-87: Railway Station Building was upgraded.

1991: Peterhoff Mansion was reconstructed and converted into a luxurious hotel.

Map 13: Shimla 1915-1991 - Development and Changes





Source: (Buck 1904)

2.4 WORLD HERITAGE

2.4.1 Linkages: Old and New

2006: Army Heritage Museum was established.2008: Track declared as UNESCO world heritage site.



Map 14: Shimla – Present-day Linkages

---- Undesignated pedestrian access to station

- O Undesignated entry/exit to station
- 💻 Railway track
- Main access roads to station
- Shimla Station Area
- Heritage structure
- Green & Forest Areas
- Annadale racecourse

2.4.2 Commuter Interchange Nodes

2011: The I.S.B.T was established 4km at Tutikandi to decongest Shimla, and provide high-end facility to tourists and locals.





Taxi/cab interchange
 Bus interchange
 Railway track
 Main access roads to station
 Shimla Station Area
 Heritage structure
 Green & Forest Areas
 Annadale racecourse
 Parking

2.4.3 Shimla Surroundings





Shimla Station Area Heritage structure Green & Forest Areas

Section 03 Egmore Railway Station

3.1 MADRAS BEFORE THE RAILWAYS

3.1.1 Pre-Railway Era (1626-1796)

1626-93: British East India Company (EIC) initially set up a factory to the north of Madras, in Armagon. Towns of Tondiarpet, Pursewaukam and Egmore were granted to EIC, which continued to rule from Fort George. By latter half of the 18th century, Madras became an important British naval base, and their administrative centre in southern India. Madras absorbed several neighbouring villages including Egmore and Chintadripet. (*Map 17: Egmore 1626-1796 Pre-Railways*) shows layout of area prefore installation of the Railways.
1796: Located at Egmore was the Military Male Asylum, and Anglo-Indian Orphanage and School. It was headed by Andrew Bell, the initiator of the Madras System for Schooling.



Map 17: Egmore 1626-1796 Pre-Railways

Heritage structure

Water bodies

Source: (Faden 1816)

3.1.2 Egmore Redoubt

The Company's Military Engineers constructed suburban forts ('redoubts') at strategic locations with blockhouses, batteries and mounted with cannons. These were outposts for the protection of the outlying quarters of Madras - and Egmore was one such redoubts. This redoubt was for protecting Egmore area, but also served as a health resort for the sick soldiers who arrived from England. (*Map 18: Egmore 1796-1799 -Egmore Redoubt*) shows location of the Egmore Redoubt.

Adjoining the precincts of the Redoubt were the premises of the Male Asylum and an Anglo-Indian orphanage.



Map 18: Egmore 1796-1799 - Egmore Redoubt

Heritage structure

Water bodies

3.1.3 Male Asylum and Redoubt

1799: After Tipu Sultan was killed, the need for the Redoubt ended. The British EIC gave the redoubt to the Asylum, and the two premises were provided with a common enclosure, area shown in (*Map 19: Egmore 1799 - Male Asylum and Redoubt*).

In the beginning of the 20th century, the Directors of the Asylum sold the Egmore Estate to the South Indian Railway Company - and it was converted into a habitation for Railway employees.



Map 19: Egmore 1799 - Male Asylum and Redoubt

Heritage structure

Water bodies

3.1.4 Linkages

The main artery of Egmore was the Pantheon Road. The road's name derives from the Pantheon built by the British at Madras in the 18th century, and hosted different kinds of entertainment shows for them. Pantheon now forms the part of Government museum, built in 19th century.

(*Map 20: Egmore 1800-1819 - Linkages* and *Map 21: Egmore 1820-1855 - Surroundings*) shows the roads and different kinds of facilities that developed over time.





3.1.5 Egmore Surroundings

1820: Regional Institute of Ophthalmology and Government Hospital (Egmore Eye Hospital), the oldest eye hospital in Asia, was shifted from Royapettah to Egmore.

1818-1821: St. Andrews Church, one of the oldest, was built to serve the Scottish community in Chennai. **1844**: Maternity Hospital was built.

1850: Country's first fine arts institution, the Madras School of Arts, was established.

1851: Government Museum was established.

1855: Doveton College for Anglo-Indian boys was established in Vepery (one of the oldest suburbs). Hospitals, school, churches, public buildings and other important establishments were built. The region was marked by booming trade.



Map 21: Egmore 1820-1855 - Surroundings

Heritage structure

Water bodies

3.2 INCEPTION OF MADRAS RAILWAYS

3.2.1 Egmore Railway Station

1906-08: Egmore Railway station was constructed as a terminus of the South Indian Railway (SIR) Company by adopting the Egmore Redoubt. It is also said that the Station came up in a place that once used to store ammunition for the British (shown in *Map 22: Egmore – 1906-1908 – Construction of Egmore Railway Station*). The Station Building was constructed on 2.5 acres land, for which 1.8 acres was acquired from S. Pulney Andy, an English physician who initially refused to sell his property.

Purchased at ₹1 lakh as compensation, the SIR invited Henry Irwin (chief engineer) to design a building to suit the traffic need.

1908: The Station Building was completed with a great range of waiting rooms, offices, restaurants, baggage rooms and Post Office inside the station.



Map 22: Egmore – 1906-1908 – Construction of Egmore Railway Station

Water bodies

3.3 TOWN AND RAILWAYS

3.3.1 Egmore Surroundings

1909: Tamil Nadu Archives Pathy along with administrative buildings and 6 record blocks was built.

1913: Regional Institute of Ophthalmology and Government Hospital were expanded.

1916: Presidency Magistrate's Court came into force.

1928: Bishop Corrie High School and Doveton Protestant College amalgamated to form Doveton Corrie High School.

1929-38: 7th, 8th and 9th stack of Tamil Nadu Archives was built.

The surroundings were developing as a commercial place, eventually becoming a town, near the Egmore Railway Station (see *Map 23: Egmore 1909-1938 - Surroundings post Railways*).

St Joseph Church, Vepery Doveton College Medical stores -Tamil Nadu Archives Pathy Presidency Magistrate's Court Figure shows evolution and effect of operation of the Egmore station alone. For a complete study, the traction between its contiguous stations characterize be included. Extension of Regional Institute of Ophthalmology 500m should also be included. e map as per map of 1921 Egmore, Tamil Nadu Archive Bas Howrah Station area Heritage structure Water bodies

Map 23: Egmore 1909-1938 - Surroundings post Railways

3.4 PRESENT SCENARIO

3.4.1 Linkages to Egmore

The linkages, nodes and infrastructure that evolved as a result of operation of the Egmore Stations are as shown in *Map 24: Egmore - Present-day Linkages, Map 25: Egmore - Present-day Interchange Nodes* and *Map 26: Egmore - Present-day Surrounding Uses*.





🗕 Railway track

- Main access roads to station
- Egmore Station area
- Platforms

Heritage structure

- Open/ green space
- Stadium
- Water bodies

3.4.2 Interchange Nodes



Map 25: Egmore - Present-day Interchange Nodes

- Parking
- Open/ green space
- Stadium
- Water bodies

3.4.3 Surrounding Uses



Map 26: Egmore - Present-day Surrounding Uses

Parking Open/green space Stadium Water bodies

Appendix II: Comparative study of National Norms, Acts and Laws applicable to Heritage protection

Section 01 Findings UBBL 2016

Sections in Italics are verbatim from The Unified Building Bye Laws for Delhi 2016.

Table 11: Findings from National Norms and Acts – UBBL 2016

	UBBL 2016			
S. No.	Prov	isions	Regulations	
1.	Institutional F	ramework	Heritage Conservation Committee	
2.	Grading/Listir	ng	1.12 Grade I, II and III. Listing does not prevent change of ownership or usage. However, change of use of such Listed Heritage Building/Listed Precinct is not permitted without the prior approval of the Heritage Conservation Committee. Use should be in harmony with the said Listed Heritage site.	
	Grade I	Category	National or Historic importance, All natural sites.	
		Scope for Changes	 No interventions be permitted either on exterior or interior. Absolutely essential and minimum changes, in the interest of strengthening and prolonging the life of the buildings/precincts. 	
		Procedure (Development Permission)	Development permission for the changes shall be given on the advice of the Heritage Conservation Committee.	
	Grade II	Category	Regional or Local importance	
		Scope for Changes	 Grade-II (A)- Internal changes and adaptive re-use may, by and large, be allowed but subject to strict scrutiny. Grade-II (B)- In addition to the above, extension or additional building in the same plot or compound could, in certain circumstances. 	
		Procedure (Development Permission)	Development permission for the changes shall be given on the advice of the Heritage Conservation Committee.	
	Grade III	Category	Buildings and precincts of importance for Townscape.	
		Scope for Changes	 Internal changes and adaptive re-use may, by and large, be allowed. For extensions and additional buildings on the same plot or compound, any change should be such that they are in harmony with and should be such that they do not detract from the existing Heritage Building(s)/Precinct(s). 	
		Procedure (Development Permission)	3. Development permission for the changes shall be given on the advice of the Heritage Conservation Committee.	
3.	General Guidelines for developmen t/ redevelopm ent/ repairs	Signage Design and Controls	1.13 Signs and Outdoor Display Structures Including Street Furniture on Heritage Sites: Commissioner, MCD/Vice- Chairman DDA/Chairman NDMC on the advice of the Heritage Conservation Committee shall frame regulations or guidelines for signages, outdoor display structures, and street furniture on Heritage sites.	

UBBL 2016				
S. No.	Provisions		Regulations	
	etc. within Heritage area/ Precinct/ Asset/ Building	Skyline	1.10 Maintaining Skyline and Architectural Harmony: After guidelines are framed, building(s) within Heritage precincts or in the vicinity of Heritage sites shall maintain the skyline in the precinct and follow the architectural style (without any high-rise or multistoried development) as may be existing in the surrounding area, so as not to diminish or destroy the value and beauty of, or the view from, the said heritage sites. The development within the precinct or in the vicinity of heritage sites shall be in accordance with the guidelines framed by the Competent Authority on the advice of the Heritage Conservation Committee or separate regulations/guidelines if any, prescribed for respective zones by Competent Authority.	
		Others	1.8 Road Widening: Widening of the existing roads under the Master Plan /Zonal Development Plan or in the Layout Plan shall be carried out considering the existing Heritage Buildings (even if they are not included in a Heritage Precinct), and/or which may affect listed natural features and areas.	
4	New construct	tion/	1.3 Restrictions on Development/Re-development/Repairs	
	Development/ Development/ Alterations or Existing Struc	/ Re- / Addition/ · Extensions to cture	etc.: No development or redevelopment or engineering operation; or Additions/alterations, repairs, renovations including painting of the building; or Replacement of special features; or Plastering; or Demolition of any part thereof, of the said Listed Buildings or Listed Precincts or Listed Natural Feature Areas shall be allowed except with the prior permission of. Before granting such permission, the agency concerned shall consult the Heritage Conservation Committee to be appointed by the Government, and shall act in accordance with the advice of the Heritage Conservation Committee. Provided that, before granting any permission for demolition or major alterations/additions to Listed Buildings (or buildings within Listed Streets or Precincts, or construction at any Listed Natural Features, or alternation of boundaries of any Listed Natural Feature Areas, objections and suggestions from the public shall be invited, and shall be considered by the Heritage Conservation Committee. Provided that, only in exceptional cases, with reasons to be recorded in writing, may refer the matter back to the Heritage Conservation Committee for reconsideration.	
5	Demolition of Building	Heritage	1.16 Implications of Listing as Heritage Buildings : The Regulations do not amount to any blanket prevention of demolition or of changes to Heritage Buildings. The only requirement is to obtain clearance from and Heritage Conservation Committee from Heritage point of view.	
6	Selling or leas Heritage Prop	sing out of the perty	1.17 Ownership not affected: Sale and purchase of Heritage Buildings do not require any permission from or Heritage Conservation Committee. The Regulations do not affect the ownership or usage. However, such usage should be in harmony with the said Listed Precincts/Buildings.	

UBBL 2016				
S. No.	Provisions	Regulations		
7	Others	 1.11 Restrictive Covenants: Restrictions existing as on date of this Notification imposed under the covenants, terms and conditions on the leasehold plots either by shall continue to be imposed in addition to Development Control Regulations. However, in case of any conflict with the Heritage preservation interest/Environmental conservation, this Heritage Regulation shall prevail. 1.6 Alteration/Modification/Relaxation in Development Norms: On the advice of the said Heritage Conservation Committee (to be appointed by the Government), and with reasons to be recorded in writing, the shall follow the procedure as per to alter, modify or relax the Development Control Norms prescribed in the MPD, or Building Bye-laws of, if required, for the Conservation or Preservation or Retention of historic or aesthetic or cultural or architectural or environmental quality of any Heritage site. 		
8	Penalties	(1.4) Violation of the regulations shall be punishable under the provisions regarding unauthorized development. In case of proven deliberate neglect of and/or damage to Heritage Buildings and Heritage Precincts, or if the Building is allowed to be damaged or destroyed due to neglect or any other reason, in addition to penal action provided under the concerned Act, no permission to construct any new building shall be granted on the site if a Heritage Building or Building in a Heritage Precinct is damaged or pulled down without appropriate permission from. It shall be open to the Heritage Conservation Committee to consider a request for rebuilding/reconstruction of a Heritage Building that was unauthorizedly demolished or damaged, provided that the total built-up area in all floors put together in such new construction is not in excess of the total built-up area in all floors put together in the original Heritage Building in the same form and style in addition to other controls that may be specified.		
9	Incentives	1.9 Incentive Uses for Heritage Buildings: In cases of Buildings located in Non-Commercial Use zones included in the Heritage Conservation List, if the owner/owners agree to maintain the Listed Heritage Building as it is in the existing state, and to preserve its Heritage state with due repairs, and the owner/owners/lessees give a written undertaking to the effect, the owner/owners/lessees may be allowed with the approval of the Heritage Conservation Committee within Permissible Use zone to convert part or whole thereof of the Non-Commercial Area within such a Heritage Building to Commercial/Office /Hotel use. Provided that if the Heritage Building is not maintained suitably, or if the Heritage value of the building is spoiled in any manner, the Commercial/Office/Hotel use shall be disallowed.		
10	Owner's Responsibility	1.2 Responsibility of the Owners of Heritage Buildings: It shall be the duty of the owners of Heritage Buildings, and buildings in Heritage Precincts or in Heritage Streets, to carry out regular repairs and maintenance of the buildings. The Government, the Municipal Corporations or the Local Bodies and Authorities concerned shall not be responsible for such repair and maintenance except for the buildings owned by the Government, the Municipal Corporations or the other local bodies.		

Section 02 Findings from AMASR Act (Amendment and Validation), 2010

Sections in Italics are verbatim from The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010.

		AMASR Act (Amendment and Validation), 2010		
S. No.	Provisions	Regulations		
1	Prohibited	 Prohibited Zone Provision: Every area, beginning at the limit of the Protected Area or the Protected Monument, as the case may be, and extending to a distance of one hundred (100) metre in all directions, shall be the Prohibited Area in respect of such Protected Area or Protected Monument. Same as otherwise provided in section 20c, no person, other than an Archaeological Officer, shall carry out any construction in any Prohibited Area. 		
2	Regulated	 Regulated Zone Provision: Every area, beginning at the limit of Prohibited Area in respect of every ancient monument and archaeological site and remains, declared as of national importance under sections 3 and 4, and extending to a distance of two hundred (200) metre in all directions, shall be the Regulated Area in respect of every ancient monument and archaeological site and remains. Provided that the Central Government may, by notification in the Official Gazette, specify an area more than two hundred (200) metre to be the Regulated Area, having regard to the classification of any Protected Monument or Protected Area, as the case may be, under section 4A. 		
3	Others	Heritage Bye-Laws: The competent authority in consultation with Indian National Trust for Arts and Cultural Heritage (INTACH), being a trust registered under the Indian Trusts Act, 1882 (2 of 1882), or such other expert Heritage bodies as may be notified by the Central Government, shall prepare Heritage Bye-Laws in respect of each Protected Monument and Protected Area. The Heritage Bye-Laws referred to in sub-section (1) shall, in addition to such matters as may be prescribed, include matters relating to Heritage Controls such as elevations, facades, drainage systems, roads and service infrastructure (including cleatric poles water and cover pinclings)		
4	Penalties	as elevations, facades, drainage systems, roads and service infrastructure (including electric poles, water and sewer pipelines). Punishment for construction, etc., in Prohibited Area: Whoever raises, on and after the date on which the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Bill, 2010, receives the assent of the President, any construction in the Prohibited Area, shall be punishable with imprisonment not exceeding two years or with fine which may extend to one lakh rupees (Rs. 1 lakh) or with both. Punishment for construction, etc., in Regulated Area: Whoever raises, on and after the date on which the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Bill, 2010, receives the assent of the President, any construction in the Regulated Area without the previous permission of the competent authority or in contravention of the permission granted by the competent authority, shall be punishable with imprisonment not exceeding two years or with fine which may extend to one lakh rupees (Rs. 1 lakh) or with both. Offences by Officers of Government: If any officer of the Central Government enters into or acquiesces in any agreement to do, abstains from doing, permits, conceals or connives at any act or thing whereby any construction or re- construction takes place in a Prohibited Area or Regulated Area, s/he shall be punishable with imprisonment for a term which may extend to three years, or with fine or with both.		

Table 12: Findings from National Norms and Acts – AMASR Act, 2010

		AMASR Act (Amendment and Validation), 2010
S. No.	Provisions	Regulations
5	Incentives	Compensation for loss or damage : Any owner or occupier of land, who has sustained any loss or damage or any diminution of profits from the land by reason of any entry on or excavations in such land or the exercise of any other power conferred by this Act, shall be paid compensation by the Central Government for such loss, damage or diminution of profits.
6	Mechanism for Sanction	 Grant of permission by competent authority within Regulated Area: Every application for grant of permission under section 20c of this Act shall be made to the competent authority in such manner as may be prescribed. The competent authority shall, within fifteen (15) days of the receipt of the application, forward the same to the Authority to consider and intimate impact of such construction (including the impact of large-scale development project, public project and project essential to the public) having regard to the Heritage Bye-Laws relating to the concerned Protected Monument or Protected Area, as the case may be. Provided that the Central Government may prescribe the category of applications in respect of which the permission may be granted under this sub-section, and the application shall be referred to the Authority for its recommendations. The Authority shall, within two (2) months from the date of receipt of application under sub-section (2), intimate to the competent authority impact of such construction (including the impact of large-scale development project, public project and project essential to the public). The competent authority shall, within one (1) month of the receipt of intimation from the Authority shall, within one (1) month of the receipt of intimation from the Authority ander sub-section (3), either grant permission under this section, it shall, by order in writing, after giving an opportunity to the concerned person, intimate such refusal within three (3) months from the date of receipt of the application to the applicant, the Central Government and the Authority. If the competent authority, after grant of the permission under sub-section (4) and during the carrying out of the repair or renovation work or re-construction of building or construction is likely to have an adverse impact on the preservation, safety, security or access to the monument considerably, it may refer the same to the Authority for its recommendations

Section 03 Findings from Model Building Bye-Laws, 2016

Sections in Italics are verbatim from Chapter 12 *"Conservation of Heritage Sites Including Heritage Buildings, Heritage Precincts and Natural Feature Areas"* of the **Model Building Bye-Laws- 2016**, Town and Country Planning Organisation, Ministry of Urban Development, Government of India.

	Model Building Bye-Laws, TCPO, MoUD India 2016				
S. No.	Pro	ovisions	Regulations		
1	Grading/Listing		7.1 Grade I, II, III and Heritage Precincts The Regulations do not amount to any blanket prevention of changes to Heritage Buildings. The only requirement is to obtain clearance from the Commissioner/ CEO, Municipal Corporation/ Municipal Council/ Nagar Panchayat or Vice-Chairman, Development Authority or District Collector, on the advice of the Heritage Conservation Committee.		
	Grade I	Category	Buildings and precincts of National or Historic importance		
		Scope for Changes	 No interventions shall be permitted either on exterior or interior. Absolutely essential and minimum changes shall be allowed, in the interest of strengthening and prolonging the life of the Buildings/or Precincts or any part or features thereof. 		
		Procedure (Development Permission)	Development permission for changes shall be given by the Commissioner/ CEO, Municipal Corporation/ Municipal Council/ Nagar Panchayat/ Vice-Chairman, Development Authority/District Collector on the advice of the Heritage Conservation Committee. Reports stating that Buildings are structurally unsafe should be checked by a Structural Engineer, and duly cross checked by the Heritage Conservation Committee, before allowing reconstruction.		
	Grade II	Category	Buildings and Precincts of regional or local importance.		
		Scope for Changes	Grade-II(A): Internal changes and adaptive re-use may by and large be allowed but subject to strict scrutiny. Care would be taken to ensure the conservation of all special aspects for which it is included in Heritage Grade-II. Grade-II(B): In addition to the above, extension or additional building in the same plot or compound could in certain circumstances, be allowed provided that the extension / additional building is in harmony with (and does not detract from) the existing heritage building(s) or precincts especially in terms of height and façade.		
		Procedure (Development Permission)	Development permission for changes shall be given by the Commissioner/ CEO, Municipal Corporation/ Municipal Council/ Nagar Panchayat/ Vice-Chairman, Development Authority/ District Collector on the advice of the Heritage Conservation Committee. Reports stating that Buildings are structurally unsafe should be checked by a Structural Engineer, and duly cross checked by the Heritage Conservation Committee, before allowing reconstruction.		
	Grade III	Category	Buildings and precincts of importance for townscape.		
		Scope for Changes	Internal changes and adaptive re-use may by and large be allowed. Changes may include extensions and additional buildings on the same plot or compound.		
		Procedure (Development Permission)	Development permission for changes would be given by the Commissioner/ CEO, Municipal Corporation/ Municipal Council/ Nagar Panchayat/ Vice-Chairman, Development Authority/ District Collector on the advice of the Heritage Conservation Committee. Reports stating that Buildings are structurally unsafe should be		

Model Building Bye-Laws, TCPO, MoUD India 2016				
S. No.	Pro	visions	Regulations	
			checked by a Structural Engineer, and duly cross checked by the Heritage Conservation Committee, before allowing reconstruction.	
	Heritage Precincts	<u>Category:</u> It ma Cultural or Herita <u>Scope for chan</u>	y consist of a number of Buildings and spaces, such as Streets with age significance worth recognition and conservation. ges:	
		1. Sensitive additions, alterations, extensions and interior renovations shall be permissible, but these should not alter the character of the Building/Precinct. The new interventions may be contemporary but subtle, or inspired by the original character and not tasteless imitation.		
		 Reconstruction is permissible but only for Buildings that are totally structurally unsafe, as certified by a Structural Engineer and corroborated by the Heritage Conservation Committee. The reconstruction should not follow the prevailing Bye-Laws but should be in such a manner which ensures that the Building/Precinct character is not diminished, and yet allows for growth and good urban design. Urban Design Guidelines should be prepared separately for each of the Listed Heritage Precincts as extension of the ByeLaws. All constructions within Heritage Precincts should be governed by the said Guidelines. <u>Procedure (Development Permission):</u> Development permission for changes shall be given by the Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat/Vice-Chairman, Development Authority/District Collector on the advice of the Heritage Conservation Committee. Reports stating that buildings are structurally unsafe should be checked by a Structural Engineer, and duly cross checked by the Heritage Previation Committee. 		
2	General Guidelines for Developme Redevelop nt/ Repairs etc. within Heritage Area/ Precinct/ Asset/ Building	Signage Design and ent/ Controls me	 8.6 Signages and Outdoor display structures including Furniture on Heritage sites: The Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat or Vice-Chairman, Development Authority or District Collector on the advice of the Heritage Conservation Committee shall frame Regulations to regulate signages, outdoor display structures and street furniture on Heritage sites. Till such regulations are framed, the following guidelines may be followed: A. National Building Code – The display or advertising signages and outdoor display structures on Buildings and land shall be in accordance with Part X – Signs and Outdoor Display Structures of the National Building Code of India, 2005. B. Additional Conditions – In addition to sub-regulation A above, the following provisions shall apply to advertising signages in different Land Use Zones- i. Residential Zone: Non-flashing neon signs with illumination not exceeding 40 watts. a) One name plate with an area not exceeding 0.1 sq m for each dwelling unit. b) For other uses permissible in the zone, one identification sign or bulletin board with an area not exceeding 10 sq m, provided the height does not exceed 1.5m. c) 'For sale' or 'For rent' signs for real estate, not exceeding 2 sq m in area, provided they are located on the premises offered for sale or rent. ii. Mix-Use Zone: Non-flashing business signs placed parallel to the wall and not exceeding 1m in height per establishment. iii. Commercial Zone: Flashing or non-flashing business signs parallel to the wall not exceeding 1m in height, provided such signs do not face residential buildings in which case only non- 	
	Model Building Bye-Laws, TCPO, MoUD India 2016			
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S. No.	Provisions	Regulations		
		 C. Prohibition of advertising signs and outdoor display structures in certain cases: Notwithstanding the provisions of sub-regulations A and B, no advertising sign or outdoor display structures shall be permitted on buildings of architectural, aesthetic, historical or Heritage importance as may be decided by the Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat or Vice-Chairman, Development Authority or District Collector on the advice of the Heritage Conservation Committee, or on Government buildings except that in the case of Government buildings only advertising signs or outdoor display structures may be permitted if they relate to the activities of the said Buildings. D. Provided, that if the Heritage Conservation Committee so advises, the Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat or Vice-Chairman, Development Authority or District Collector, shall refuse permission for any signage or outdoor display structure. E. The Municipal Council/Nagar Panchayat or Vice-Chairman, Development Authority or District Collector, shall refuse permission for any signage or outdoor display structure. F. Signages and Outdoor display structures (including street Furniture) shall require the approval of the Heritage Conservation Committee, which may prescribe additional requirements for the same. 		
	Skyline	8.5 Protection of visual landscape and surroundings: Buildings within Heritage Precincts, or in the vicinity of Heritage sites, shall strive to maintain the skyline in the Precinct and follow the architectural style (without any high-rise or multi-storeyed development) as may be existing in the surrounding area, so as not to diminish or destroy the aesthetic value, or view of, from the said Heritage sites. The development within the Precinct or in the vicinity of Heritage sites shall be in accordance with the Urban Design Guidelines framed by the Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat or Vice- Chairman, Development Authority or District Collector on the advice of the Heritage Conservation Committee or separate Regulations, if any, prescribed for the respective zones by the Municipal Corporation/Municipal Council/Panchayat/Development Authority/ District Collector.		
	Others	 9.1 Road widening i. If road widening lines are proposed under the Master Plan, they shall be such that they protect and not detract from the said Heritage sites. ii. If there are any new road widening lines proposed in the revised draft or sanctioned Development Plans/Master Plans/Regional Plans, the Municipal Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat or Vice-Chairman, Development Authority or District Collector/Heritage Conservation Committee shall consider the Heritage provisions and environmental aspects, while considering applications for Development Permissions in these areas. Necessary steps may be taken to modify the Development Plan/Master Plan/Regional Plan accordingly 		

	Model Building Bye-Laws, TCPO, MoUD India 2016			
S. No.	Provisi	ons	Regulations	
			Pending this action, the road widening/development of new roads shall not be carried out.	
			iii. No widening of the existing roads under the Development Plan/Master Plan/Regional Plans shall be carried out in a manner which may affect the existing Heritage Buildings (even if they are not included in a Heritage Precinct), or which may affect Listed Natural Features. Widening of the existing roads under the Master Plan or Zonal Development Plan or Layout Plan shall be carried out considering the existing Heritage Buildings (even if they are not included in a Heritage Precinct), or which may affect Listed Natural Feature Areas.	
			9.2 Master Plan Reservations: If there are any Development Plan/Master Plan/Regional Plan Reservations shown on Heritage sites, the same shall not be implemented. If required, Municipal Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat or Vice-Chairman, Development Authority or District Collector, on the advice of the Heritage Conservation Committee, shall approach the State Government to get these Reservations modified/deleted.	
3	New	8. Develop	ment Control	
	construction/ Development/ Re- Development/ Addition/ Alterations or Extensions to Existing Structure	 8.2 Restrictions on Development/Re-Development/Repairs etc.: No development or redevelopment or engineering operation of additions/alterations, repairs, renovations including painting of the building Replacement of special features or plastering or demolition of any part thereof of the said Listed Buildings or Listed Precincts or Listed Natural Feature Areas shall be allowed except with the prior permission of the Commissioner/CEO, Municipal Corporation/Municipal Council/Naga Panchayat or Vice- Chairman, Development Authority or District Collector Before granting such permission, the agency concerned shall consult the Heritage Conservation Committee, and shall act in accordance with the advice of the Heritage Conservation Committee. Provided that, before granting any permission for demolition or majo alterations/additions to listed buildings (or buildings within listed streets or precincts), or construction at any listed natural feature areas, or alteration or boundaries of any listed natural feature areas, objections and suggestions from the public shall be invited and considered by the "Heritage Conservation Committee". Provided that, only in exceptional cases, with reasons to be recorded in writing, the Commissioner/CEO, Municipal Corporation/Municipal Council/Nagar Panchayat or Vice- Chairman, Development Authority or District Collector may refer the matter back to the Heritage Conservation Committee for reconsideration. 		
4	Others	8.3 Alterat advice of th in writing Council/Nas Collector sh Country Pl alter, modif the Conser or architect Building/Pre	tion/Modification/Relaxation in Development Norms: On the e Heritage Conservation Committee and with reasons to be recorded , the Commissioner/CEO, Municipal Corporation/Municipal gar Panchayat or Vice- Chairman, Development Authority or District hall follow the procedure as per Development Authority Act/Town and anning Act/Building Byelaws/Development Control Regulations to y or relax the Development Control Norms prescribed, if required, for vation or Preservation or Retention of historic or aesthetic or cultural tural or environmental quality or beauty or vista of any Heritage ecinct.	

	Model Building Bye-Laws, TCPO, MoUD India 2016			
S. No.	Provisi	ons	Regulations	
		8.4 Develop In case of developmen Guidelines which sh Corporation Developme Conservatio 8.7 Restric terms and o Municipal O Authority/Di Developme Heritage pri	oment Permission for Heritage Precincts/Natural Feature areas: Notified streets, Precincts, Areas and Natural Feature Areas, Int permissions shall be granted in accordance with Urban Design prescribed for respective Streets, Precincts/Natural Feature Areas, all be framed by the Commissioner/CEO, Municipal /Municipal Council/Nagar Panchayat or Vice-Chairman, nt Authority or District Collector on the advice of the Heritage on Committee. tive Covenants: Restrictions existing as imposed under covenants, conditions on leasehold plots, either by the State Government or by Corporation, Municipal Council/Nagar Panchayat or Development istrict Collector, shall continue to be imposed in addition to nt Control Regulations. However, in case of any conflict with the pervation the Heritage Regulations shall prevail	
5	Penalties	8.8		
	Incontinuo	Violation of the Regulations shall be punishable under the provisions regunauthorized development. In case of proven deliberate neglect of damage to Heritage Buildings and Heritage Precincts, or if the Building is a to be damaged or destroyed due to neglect or any other reason, in add penal action provided under the Act concerned, no permission to construnew Building shall be granted on the site if a Heritage Building or Buildin Heritage Precinct is damaged or pulled down without prior permission Municipal Commissioner/CEO, Municipal Corporation/Municipal Council Panchayat or Vice-Chairman, Development Authority or District Collector. be open to the Heritage Conservation Committee to consider a requirebuilding/reconstruction of a Heritage Building that was unauthor demolished or damaged, provided that the total built-up area in all floots put together in the original Heritage Building in the same for style, in addition to other conditions/controls that may be appeaded.		
6	Incentives	Commercia owner/owne existing sta owner/owne	e uses for Heritage Buildings : In case of Bbuildings located in Non- I Use zones included in the Heritage Conservation List, if the ers agree to maintain the Listed Heritage Building as it is in the ate and to preserve its Heritage state with due repairs, and the ers/lessees give a written undertaking to that effect, the	
		owner/owne Conservatio thereof of Commercia maintained manner, the 10.1 Grant for develop while permi FAR, the sa Rights Cert Governmen be granted Corporation Developme Conservatio 10.2 Herita Buildings, a of the Ma	ers/lessees may be allowed - with the approval of the Heritage on Committee - within permissible use zones to convert part or whole the Non-Commercial Area within such a Heritage Building to I/Office/Hotel use. Provided that, if the Heritage Building is not suitably or if the Heritage Value of the Building is altered in any commercial/Office/Hotel use shall be disallowed. of TDR in cases of loss of development rights: If any application ment is refused under these Regulations, or conditions are imposed ting such development which deprive the owner of any unconsumed id owner(s)/lessee(s) shall be compensated by grant of Development tificate of the nature set out in Appendix I, and as prescribed by t from time to time. The extent of Development Rights Certificate to may be determined by the Municipal Commissioner/CEO, Municipal /Municipal Council/Nagar Panchayat or Vice- Chairman, nt Authority or District Collector, on the advice of the Heritage separate Fund may be created, which would be kept at the disposal unicipal Commissioner/CEO, Municipal ger Panchayat or Vice-Chairman, Development Authority or District and be created, which would be kept at the disposal unicipal Commissioner/CEO, Municipal Corporation, Municipal and be determined by the created, which would be kept at the disposal unicipal Commissioner/CEO, Municipal Corporation, Municipal and be determined by the created, which would be kept at the disposal unicipal Commissioner/CEO, Municipal Corporation, Municipal and be determined by the created which would be kept at the disposal unicipal commissioner/CEO, Municipal Corporation, Municipal and be determined by the created by the c	

	Model Building Bye-Laws, TCPO, MoUD India 2016			
S. No.	Provisions		Regulations	
		Heritage Conservation Committee. The fund shall be used mainly to support the cost of Listing of Heritage Buildings/Sites, and for expert guidance and fees of architects, engineers and other experts while the actual Conservation work shall be supported by the owners or from sources other than the Heritage Fund.		
7	Owner's Responsibilit y	8 Development Control 8.1 Responsibility of the owners of Heritage Buildings: It shall be the responsibility of the owners of Heritage Buildings and Buildings in Heritage Precincts to carry out regular repairs. The State Government/Municipal Corporations/Municipal Councils/Nagar Panchayats/Rural Local Bodies and Authorities shall not be responsible for such repair and maintenance, except for the buildings owned by them.		

Appendix III: Comparative study of Heritage Protection Norms of Selected Cities

Section 01 Findings from Jaipur City

E.

Sections in Italics are verbatim from The Jaipur (Walled City) Heritage Conservation and Protection Regulations 2020.

			Jaipur City
S. No.	Provis	sions	Regulations
1	Institutional Fra	amework	 State Heritage Committee. Technical Heritage. Heritage Committee Cell.
2	Grading/Listing	9	Grade I, II and III
	Grade I	Category	National Importance/ASI protected and other similar Heritage Assets.
		Scope for Changes	 No interventions be permitted either on exterior or interior. Absolutely essential and minimum changes, in the interest of strengthening and prolonging the life of the Buildings/Precincts.
		Procedure (Developme nt Permission)	State Government on the advice of the Technical Heritage Committee.
	Grade II	Category	State importance/State owned and Other similar Heritage Assets
		Scope for Changes	Grade-II(A): Internal changes and adaptive re-use may by and large be allowed but subject to strict scrutiny. Care would be taken to ensure the conservation of all special aspects for which it is included in Heritage Grade-II. Grade-II(B): In addition to the above, extension or additional building in the same plot or compound could in certain circumstances, be allowed provided that the extension / additional building is in harmony with (and does not detract from) the existing heritage building(s) or precincts especially in terms of height and façade.
		Procedure (Developme nt Permission)	State Government on the advice of the Technical Heritage Committee.
	Grade III Categor	Category	Local importance, Private properties and Other similar Heritage Assets.
		Scope for Changes	 Internal changes and adaptive reuse, and any Commercial use with the approval of competent authority; without change in exterior façade as per Façade Control Guidelines; Changes can include extensions and additional buildings on the same plot or compound.
		Procedure (Developme nt Permission)	Technical Heritage Committee on the advice of Heritage Cell.
3	Building Parameters	Setback (in metre)	As per prevailing Building line.
	and Control Guidelines	Ground coverage	Within Plot/Property area.

			Jaipur City
S. No.	Provisions		Regulations
		Max. Permissible Height (in metre)	Roads/Main Bazars: 15m (G+3), Internal Roads: 12m (G+2)
		Parking	As per Parking Policy for Walled City.
		Built-Up Area Ratio	As achieved within permissible ground coverage and permissible maximum Height/No. of floors.
		Basement	No Basement shall be allowed except in special cases, for public purposes like parking/public utilities, MRTS, etc. with specific permission of the State Government.
4	General Guidelines for Development/ Redevelopme nt/ Repairs etc. within Heritage Area/ Precinct/ Asset/ Building	Urban structure	New development should seek to understand, acknowledge and make a positive contribution to the existing urban structure. A new intervention, which responds well to urban structure, would sit well within a group, rather than associate itself with a particular building.
		Urban grain	New developments should respect urban grain – the pattern of streets and spaces – rather than of buildings. Urban grain tends to be influenced by the rhythm of architectural composition and the prevailing relationship of solid-to-void in buildings.
		Scale	New design should consider the surrounding scale, hierarchy and massing of the existing built form. Buildings within Heritage Precincts/Conservation Area or in the vicinity of Heritage sites shall maintain the skyline in the precinct, and follow the architectural style (without any high-rise or multi-storeyed development) as may be existing in the surrounding area, so as not to diminish or destroy the value and beauty of, or the view from, the said Heritage sites. New developments outside the conservation area should not be more than two floors on 40ft wide road, and not more than three floors on roads more than 40ft wide.
		Parking	Parking provisions in relation to the Heritage properties located on the narrow roads and converted to commercial use would be done through Park-and-Ride facility provided by the property owner.
		Materials and detailing	The sensitive use of appropriate color, texture and pattern of materials, whether traditional or contemporary, is also important. Their use and detailing, particularly near to open landscapes, is crucial in making a development stand out or blend in.
		Landscape	New development should aspire to blend and coalesce with the existing built form without simply replicating it.
		Views and Landmarks	New design should consider ways to enhance or protect their function as landmarks. In some instances, new designs might provide the opportunity to create new vistas towards landmarks, restore older views that have been lost or compromised, or create dynamic juxtapositions of old and new, so adding texture and variety to the townscape.
		Historical developmen t	New design should consider and respond to these layers of history – the 'narrative' of the place. Analysis of historical maps along with archive material and published sources are very useful analytical tools to understand the historical development of a place.

	Jaipur City			
S. No.	Provisions	Regulations		
5	Architectural Control Guidelines	The owners of buildings situated on main roads/main bazars shall strictly follow the Architectural Control Guidelines for façade and all other Architectural elements like Arches, Jali, Jharokha, Railing, Colour Scheme etc. of buildings. No deviation/change of façade as per Architectural Control Guidelines shall be permitted. In case any owner of building has changed the façade or erected temporary structure like hoardings, sign boards, sheds, outdoor advertising structure, poles etc., deviating the guidelines, shall have to reconstruct/restore on his own expenses, as per the approved guidelines, within 60 days of issuance of notice by Jaipur Municipal Council, in this regard, even if the front elevation of any building is approved by the Competent Authority.		
6	New construction/ Development/ Re- Development/ Addition/ Alterations or Extensions to Existing Structure	No development or redevelopment or engineering operation or additions/alterations, repairs, renovations including painting of the building, replacement of special features or plastering or demolition of any part thereof of the said listed buildings or listed precincts or listed natural feature areas situated within walled city area shall be allowed except with the prior permission of Competent Authority. Before granting such permission, the Competent Authority concerned shall mandatorily consult the Heritage Cell/Technical Heritage Committee and shall act accordingly.		
7	Prohibited	 Scope of change/Adaptive reuse implications - Works relating to changes, development or redevelopment or additions, alterations and renovation of heritage sites shall be permitted in accordance with following: - 1. Demolition (part or whole) and reconstruction except in the specific case of building getting damaged due to any natural calamity, disaster, fire, riots etc. and dilapidated condition of structure being unsafe for public or occupants of the building. 2. Change in the exterior façade or deviation of Architectural/Façade Control Guidelines. 3. Alteration or addition including structural changes (in Grade-I heritage sites/buildings). 4. Removal or alteration of carvings, paintings, and other decorative architectural elements. 		
8	Repairing	Application for construction or reconstruction or repair or renovation in Conservation area - Any person, who owns or possesses any building or structure or land in any conservation area, and desires to carry out any construction or reconstruction or repair or renovation of such building or structure on such land, as the case may be, may make an application to the competent authority for carrying out construction or reconstruction or repair or renovation, as the case may be.		

	Jaipur City			
S. No.	Provisions	Regulations		
9	Maintenance of Heritage Building	 The State Government may by an order place any listed/protected heritage asset owned by State Government or any local authority or any such public authority at the disposal of the Jaipur Municipal Corporation for the purpose of maintenance. The Jaipur Municipal Corporation may, for the purpose of conservation of a listed/protected heritage asset vested in it or in which it has acquired right for the purpose of maintenance, enter into an agreement with any person, firm or trust on such terms and conditions, not inconsistent with the provisions of these regulations, as may be specified in the agreement. Notwithstanding anything contained in these regulations, the person, firm or trust referred to in 18(1) shall be entitled to collect and retain the whole or such portion of the fee leviable under these regulations and for such period, as may be agreed upon between the Jaipur Municipal Corporation and such person, firm or trust, as the case may be having regard to the expenditure involved in the maintenance of the heritage asset and collection of fee, interest on the capital invested, reasonable return of the investment and the volume of visitors 		
10	Inventory and Mapping	The process of GIS based inventorying, mapping and valuation of all properties and heritage assets within the walled city area will be carried out by the Heritage Cell along with the agency designated by Municipal Corporation, Jaipur in coordination with City Stakeholder Group. The Heritage Cell will gather prior heritage asset inventories, which include monuments, routes, landscapes, neighborhoods, buildings, practices, and traditions. Developing a preliminary list and map including their historical growth, the Heritage Cell in coordination with the City Stakeholder Group will then carry out a series of local workshops open to the community.		
11	Others	Heritage Databank: The Heritage Cell shall compile a comprehensive databank of all heritage assets along with data connected therewith. It may also include any data pertaining to such heritage sites which have potentials to be included as protected heritage in the future. The heritage databank will be maintained and periodically updated as and when required, by the Cell which will also be responsible for adding and/or removing protected heritage assets from this record.		

		Jaipur City
S. No.	Provisions	Regulations
12	Penalties	 Whoever; - a. destroys, injures, mutilates, defaces, alters, removes, disperses, misuses, imperils or allows to fall into decay a protected heritage asset, b. being the owner or occupier of protected heritage asset, contravenes an order made under these rules, c. carries out any construction, re-construction or repair and renovation in the Conservation Area without the previous permission of the competent authority or in contravention of the permission granted by the competent authority, shall be punishable under the Section 194 of the Rajasthan Municipalities Act, 2009 Whoever contravenes any other provisions of these rules or the provisions of the Regulations, made there under shall be penalized as per the provisions of Municipal Act, 2009 or the rules and regulations framed therein
13	Incentives	 Flexible land use/building use for Heritage Buildings: In cases of buildings located in non-commercial use zones included in the Heritage Conservation List, if the owner/owners agree to maintain the listed Heritage Building as it is in the existing state and to preserve its heritage state with allowed internal changes and due repairs and the owner/owners/lessees give a written undertaking to that effect, the owner/owners/lessees may be allowed with the approval of the competent authority to convert part or whole thereof of the non-commercial area within such a Heritage Building to commercial use/uses. <u>Transferable development rights:</u> Facility of Transferable Development Rights shall also be allowed as per TDR policy of the State Government. <u>Tax rebates (UD tax and other taxes as applicable):</u> In cases of listed Heritage Building as it is in the existing state and to preserve its heritage state with allowed internal changes and due repairs/carry out sensitive adaptive reuse the owner/owners/lessees give a written undertaking to that effect, they will be given tax rebate in Urban Development Tax for residential properties/commercial properties, as approved by the State Government. The State will consider all projects proposed in selected heritage properties, that wish to provide tourism related infrastructure, to be equal to tourism projects and avail the same special incentives in taxes (as mentioned in the Tourism Policy). This includes tax-holidays in Electricity Duty, Luxury tax, Entertainment tax and Sales tax, with exemptions in Stamp Duty and Land charge for rent/sale. <u>Heritage Fund:</u> The State Government may, pay to the by way of grants such sum of money as the State Government may think fit for being utilized for the purposes of these Regulations.
14	Owner's Responsibility	It shall be the duty of the owners of Heritage Buildings and building in heritage precincts or in heritage streets situated within walled city to carry out regular repairs and maintenance of the buildings on their own expenses. The State Government, the Municipal Corporation or any Authorities shall not be responsible for such repair and

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	Jaipur City			
S. No.	Provisions	Regulations		
		maintenance except for the buildings owned by them or except in case the repair and maintenance of any street is carried out under any special project which may include façade of privately owned buildings also.		
15	Mechanism for sanction	The Heritage Cell shall prepare Guidelines if required, in addition to these regulations, in respect of the heritage assets in Walled city, which shall be placed before the Technical Heritage Committee for its approval.		

Section 02 Findings from Ahmedabad City

Sections in Italics are verbatim from **Gujarat Comprehensive Development Control Regulations - 2017**, Urban Development and Urban Housing Department, Government of Gujarat.

	Ahmedabad City		
S. No.	Provisions		Regulations
1	Institutional F	ramework	Heritage Conservation Committee.
2	Building Parameters and Control Guidelines	Setback (in m)	3m (from central line of existing street, where regular line of street is not prescribed).
		FSI	2
		Ground coverage	 Building-units with area 500 sq. m. or less: In case of open or partially built plot, the ground coverage shall be the entire area of the building-unit after keeping required margin, common plot, setback, parking as per these regulations; Building unit with area 500-1500 sq. m.: 75%. Building unit with area more than 1500 sq. m.: 65%
		Max. Permissible Height (in m)	 Maximum permissible building height shall be regulated according to the width of the road on which it abuts, Up to 7.5m: Twice the width of the abutting road or open space. 7.5m-12m: 15m; 12m and above: 25m
		Parking	Not required if the proposed uses are hospitality and/or sympathetic adaptive re-use to residential.

Table 14: Findings from Heritage Protection Norms – Ahmedabad City

		Ahmedabad City
S. No.	Provisions	Regulations
	Basement	 No basement shall be permitted within required set back. All-round margin of 1.00m shall have to be kept from adjoining property for construction of basement. Road-side margin of 4.5m shall be provided. For margins except Road-side margin, space of 3.0m shall have to be kept from adjoining building-unit boundary for construction of basement. Basement shall be allowed for parking if the area of building-unit is more than 300 sq. m. For building-units with area more than 1500 sq. m., basement shall be allowed for parking at two levels
3	Open Space Regulations	The location and dimensions of the open space shall be based on the dimensions of the building-unit and the proposed building height, whichever is higher shall be applicable.
4	Permissible Uses	For Heritage areas - Dwellings, Mercantile, Hospitality; Other areas of core walled city - Dwelling, Mercantile, Hospitality, Religious, Public - Institutional, Educational (Depending on the road width).
5	New construction/ Development/ Re- Development/ Addition/ Alterations or Extensions to Existing Structure	For Heritage Areas - Additions and/or alterations shall have to be carried out based on the guidelines provided in the Heritage Conservation Plan without compromising the original character of the buildings.
6	Others	Heritage Conservation Plan Structures, Buildings and Precincts in the Core Walled City shall be notified under 'Heritage Areas' by the Competent Authority as identified in the Heritage Conservation Plan prepared by the Competent Authority with the help of Heritage Committee. The list of the Heritage Areas shall be made available to the applicant on request. The remaining areas shall be referred to as 'Other Areas of Core Walled City' in this Regulation.
7	Penalties	 Conforming with General Development Control Regulations (GDCR) without applying for Development Permission Financial penalty for undertaking building which is in conformity with Development Control Regulations prescribed in relevant GDCRs. of the competent development authority, but which has been undertaken without applying for a Development Permission, shall be fifteen (15) times the scrutiny fees that is leviable on the building-unit, as the case may be. Conforming with GDCR after applying, but before Obtaining Development Permission, and not as per Submitted Plan. Financial penalty for undertaking building which is in conformity with Development Regulations prescribed in the relevant GDCR of the competent development authority, but which has been undertaken without revising Development Permission, shall be ten (10) times the Revised Development Permission Fees that is leviable on the building-unit, as the case may be. Conforming with GDCR after applying, but before Obtaining Development Permission, shall be ten (10) times the Revised Development Permission Fees that is leviable on the building-unit, as the case may be.

	Ahmedabad City		
S. No.	Provisions	Regulations	
		 Financial penalty for undertaking building which is in conformity with Development Regulations prescribed in the relevant GDCR of the competent development authority, and the application made for Development Permission, but which has been undertaken without obtaining a Development Permission shall be five (5) times the Development Permission Fees that is leviable on the building-unit, as the case may be. Open Uses of Land including Layout and Sub-division without Obtaining Development Permission: Financial penalty for undertaking open uses of land including layout and sub-division without Obtaining Development Regulations prescribed in the relevant GDCR of the competent development authority, but which has been undertaken without obtaining a Development Permission shall be twice (2) times the Development development authority, but which has been undertaken without obtaining a Development Permission Fees that is leviable on the building-unit, as the case may be. Penalties for Making Unauthorized Use of a Building (Refer Regulation No. 2.12.1) Financial Penalty for making unauthorized use of a building shall be four (4) times the Development Permission Scrutiny Fees that is leviable for the Built-Up area of the building. 	
8	Incentives	 Tradable Development Right (TDR) Tradable Floor Space shall be provided for a building-unit with Heritage Structures or Building, or for building-units within a Heritage Precinct notified by the Competent Authority in the Heritage Conservation Plan. Such Heritage Buildings shall be classified on the basis of their respective Heritage Value as per Heritage Conservation Plan.	
9	Mechanism for sanction	(Refer Regulation No. 4.1.3 and 4.2.3) The Owner/Developer shall submit to the Competent Authority the following documents, drawings, and specifications along with application for obtaining and revising a Development Permission.	

Section 03 Findings from Mumbai

Sections in Italics are verbatim from the **Development Control Regulations for Greater Bombay, 1991**, schedule list annexed to Maharashtra Government Notification No. DCR 1090/3197/RDP/ UD- II dated 21st April 1995; and **Development Control and Promotion Regulation, 2034**, Municipal Corporation of Greater Mumbai.

Mumbai			
S. No.	Provision	IS	Regulations
1	Institutional Framew	work	Heritage Conservation Committee.
2	Grading/Listing		Grading of the Listed Buildings/Listed Precincts - In the last column of the said list of Heritage Buildings/Heritage precincts, 'Grades' such as I, II or III have been indicated. The meaning of these Grades and Basic Guidelines for Development Permissions are: Listing does not prevent change of ownership or usage. However, such usage should be in harmony with the said listed Precinct/Building. Care will be taken to ensure that the Development Permission relating to these buildings is given without delay.
3	General Guidelines for development/ redevelopment/ repairs etc. within Heritage Area/ Precinct/ Asset/ Building	Signage design and controls	Prohibition of advertising signages and outdoor display structures in certain cases: Notwithstanding the provisions of sub-regulations (1) and (2), no advertising sign or outdoor display structures shall be permitted on Buildings of Architectural, Aesthetical, Historical or Heritage importance as may be decided by the Commissioner, or on Government buildings except in the case of Government buildings where only advertising signages or outdoor display structures may be permitted if they relate to the activities for the said buildings' own purposes or related programs. (Development Control Regulations for Greater Mumbai, 1991).
		Skyline	Buildings included in Listed Heritage Precincts shall maintain the skyline in the Precinct (without any high-rise development) as may be existing in the surrounding area, so as not to diminish or destroy the value and beauty of the said listed Heritage Buildings/Heritage Precincts. The Development within the Precinct shall be in accordance with the guidelines framed by Commissioner in consultation with Heritage Conservation Committee.
4	New construction/ Development/ Re- Development/ Addition/ Alterations or Extensions to Existing Structure		 Heritage Regulation for Greater Bombay 1995: No development or redevelopment or engineering operation; or additions, alterations, repairs, renovation including the painting of buildings, replacement of special features or demolition of the whole or any part thereof; or plastering of said Listed/Heritage Buildings or Listed/Heritage Precincts shall be allowed except with the prior written permission of the Commissioner. The Commissioner shall act on the advice of/in consultation with the Heritage Conservation Committee to be appointed by the Government (hereinafter called the said Heritage Conservation Committee). Development Plan 2034: No development or redevelopment or engineering operations; or additions, alterations, repairs, renovation including the painting of buildings, replacement of special

Table 15: Findings from Heritage Protection Norms – Mumbai

		Mumbai
S. No.	Provisions	Regulations
		features or demolition of the whole or any part thereof; or plastering of said Listed/Heritage Buildings or Listed/Heritage Precincts shall be allowed except with the prior written permission of the Commissioner. The Commissioner shall act on the advice of/in consultation with the Mumbai Heritage Conservation Committee to be appointed by the Government (hereinafter called MHCC). Provided that in exceptional cases, for reasons to be recorded in writing, the Commissioner may overrule the recommendation of the MHCC. The decision of the Municipal Commissioner shall not be subject to challenge by the MHCC.
5	Others	 Requirements of Sites: No land shall be used as a site for the construction of buildings — (n) if the proposed development is likely to involve damage to or have deleterious impact on or is against urban aesthetics or environment or ecology and/or on Historical/ Architectural/ Aesthetical Buildings and Precincts or is not in the public interest. Development Plan Reservation: If there are any DP Reservations on listed Heritage structure and due to development of such site if adversely affects its character, then Municipal Commissioner on recommendation of MHCC shall initiate the process of modification/deletion of such reservation following due procedure. Relaxation in Building and other requirements: Heritage Buildings of Grade-I and II as well as authorized and structurally sound retainable buildings may be included in the URC, but shall have to be kept as they are, along with land appurtenant, and this area shall be counted towards the slab of Incentive FSI but shall not be considered for FSI under this Regulation. As regards such Heritage Structures, the Promoter/Developer shall have to contribute Heritage Cess at 5% of ASR on the basis of BUA of the Heritage precincts. However, if the URS contains Grade I structure, the HPC shall consult the MHCC before granting approval.
6	Incentives	 Heritage Regulations for Greater Bombay, 1995 Grant of Transferable Development Rights in cases of loss of Development Rights - If any application for development is refused under this Regulation or conditions are imposed while permitting such development which deprive the owner/lessee of any unconsumed FSI the said owner/lessee shall be compensated by grant of Development Rights Certificate (hereinafter referred to as "TDR") of the nature set out in Development Control Regulation No. 34 and Appendix VIJA and as may be prescribed by Government from time to time. The TDR from Heritage Buildings in the island city may also be consumed in the same ward from which it originated. The extent of TDR Certificates to be granted may be determined by the Commissioner, if required in

Mumbai			
S. No.	Provisions	Regulations	
No.		 Consultation with the Heritage Conservation Committee and will not be awarded unless sanctioned by Government. D. Repair Fund - Non-cessed buildings included in the said list shall be repaired by the owners/lessees of the said buildings themselves or if they are cessed buildings those can be repaired by MHADA or by the owner or by the Cooperative Society or the owners and for occupiers of the old building. With a view to give monetary help for such repairs a separate fund may be created, which would be kept at the disposal of Municipal Commissioner, Bombay Municipal Corporation, who will make disbursement from the funds in consultation with Heritage Conservation Committee. Provision for such a fund may be made through District Planning and Development Council Budget. Draft Development Plan 2034 Grant of Transferable Development Rights in case of loss of Development Rights: if any application for development of Heritage Building(s) is refused under this Regulation and conditions are imposed while permitting such development which deprive the owner/lessee of any unconsumed Development Rights, the said owner/lessee shall be compensated by grant of Development Right Certificate in terms of TDR as provided in these Regulations. The extent of TDR permissible will be the difference between Zonal (basic) FSI plus area of plot and the consumed BUA of the Heritage structure. The grant of TDR shall be subject to a contract between the owner/lessee and MCGM binding the owner/lessee sof Heritage Building in the prescribed manner as recommended by MHCC and approved by Municipal Commissioner. In such cases the potential of the plot shall be perpetually reduced to the extent of existing BUA of the Structure. Additional regulations for the grant of TDR in the founds of the rest of any restrictions imposed by the Commissioner of AUM of the Structure. A doitions for grant of such rights: As provided in Regulation No. 52 DRs of the owner/lessee of any Heritage Building	
		perpetually reduced to the extent of existing BUA of the structure.	

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Mumbai			
S. No.	Provisions	Regulations	
7	Mechanism for Sanction	 Development Permission and Commencement Certificate: (2) Items of operational construction by some authorities excluded: —Construction for operational purposes, including maintenance of operational structures, by the following organizations, authorities or departments, whether temporary or permanent, may be exempted by the special permission of the Commissioner in each case from the purview of these Regulations, except those relating to floor space index and fire precautions: (i) Railways; (ii) National Highways; (iii) National Waterways; (iv) Major Ports; (v) Aerodromes and Airports. 	

Section 04 Findings from Kolkata

Sections in Italics are verbatim from the **West Bengal Act LIX of 1980, Kolkata Municipal Corporation Act, 1980**.

	Kolkata				
S. No.	Provis	ions	Regulations		
1	Institutional Fran	nework	Heritage Conservation Committee		
2	Grading/Listing		The Corporation with the recommendation of the Heritage Conservation Committee has prepared a Graded List of Heritage Buildings for Grade-I, Grade-IIA and Grade-IIB. The gradation of a Heritage Building according to its historical, architectural, environmental, or ecological purpose shall be such as may be prescribed.		
	Grade I	Scope for Changes	No external change will be permissible. Use of the building should also be compatible with the category of the Heritage Building		
	Grade II	Scope for Changes	 Grade-II(A): Same as Grade-I for the Heritage Building. But new construction may be allowed in the open land within the premises in compatible manner with the Heritage Building. Grade-II(B): Horizontal and vertical addition and alteration of the building may be allowed incompatible with the Heritage Building. 		
	Grade III	Scope for Changes	A plaque depicting the history of the building should be provided. Where the structure is having no architectural importance, demolition of the structure may be allowed.		

Table 16: Findings from Heritage Protection Norms – Kolkata

Kolkata			
S. No.	Provisions		Regulations
3	General Guidelines for development/ redevelopment / repairs etc. within Heritage area/ precinct/ asset/building.	Materials and detailing	Repairing/addition/alteration works shall be done through traditional building materials and construction technique. Any kind of use of new material shall be done with the approval of the Heritage Conservation Committee on recommendation of the enlisted Conservation architect.
		Signage design and controls	On approval from the Heritage Conservation Committee hoardings, signage etc. may be allowed if they do not obstruct the view of the Heritage Building or is in harmony with the Heritage Building.
4	New construction/ Development/ Re- Development/ Addition/ Alterations or Extensions to Existing Structure		 Grade Table. If surplus buildable land is available. The construction shall have to be compatible with the existing Heritage Building. The drawings and designs for such construction shall be prepared and recommended by the enlisted Conservation Architect. Addition/alteration proposal shall be in accordance with the prevailing KMC Building Rules.
5	Demolition of Heritage Building		Normally no Heritage Building shall be permitted for demolition. However, on prior approval of the Heritage Conservation Committee on the recommendation of the enlisted Conservation Architect, the non-significant portion of a Heritage Building may be allowed to be demolished.
6	Repairing		 To repair any Heritage Building, a prior permission of the Heritage Conservation Committee is required for: 1. Restoration of façade, structure, and interior. 2. Restoration of architectural elements/features. 3. Reconstruction of the portion which has been collapsed. 4. Reconstruction of the irreparable portion of the building to match with the existing characteristics.
7	Selling or leasing Heritage Propert	g out of the y	Selling or leasing out of the Heritage Property: No permission is required for the buildings which are already declared as Heritage Building. However, the owner should mention the Heritage status of the building in registered document during such transfer of property. The owner should apply, along with the intending buyer, jointly to KMC prior to transfer of any property for the buildings which are under considerations for declaring as Heritage Building for permission.
			Power of Corporation to require, purchase or take on lease Heritage Building: Subject to the other provisions of this Act, the Corporation may acquire, purchase, or take on lease any Heritage Building for the purpose of preservation and conservation thereof: Provided that in the case of a Heritage Building declared as such for the purpose of preservation and conservation as required under sub-clause (ii) of clause (a) of sub-section (4) of section 31 of the West Bengal Town and Country (Planning and Development) Act, 1979 (West Ben. Act XIII of 1979), the approval of the concerned department of the State Government shall be taken.

Kolkata			
S. No.	Provisions	Regulations	
8	Change of Use of Heritage Building	Heritage Conservation Committee may consider change of use. The proposed change of use shall be in terms of the Act and Rules and Regulations of the Kolkata Municipal Corporation.	
9	Maintenance of Heritage Building	One can avail oneself of the national or international funds for the maintenance of such Heritage Buildings if properly approached through Conservation Architect. Compatible re- use of the building may be permitted for commercial benefits. In some special cases property tax may be reduced/exempted under Section 425 K of KMC Act, 1980. Agreement with owner of Heritage Building pending acquisition: The Municipal Commissioner may, pending acquisition of a Heritage Building by the Corporation under this Act and with the approval of the Mayor-in-Council, propose to the owner of such Heritage Building to enter into an agreement with the Corporation for a specified period for the maintenance of such Heritage Building. Voluntary contribution and agreement with any voluntary organization, person or company: The Municipal Commissioner may receive voluntary contributions towards the cost of maintaining any Heritage Building, and may give order as to the management and application of such contributions for the purpose of preservation and conservation of such Heritage Building	
10	Inventory and Mapping	Buildings with Architectural significance and Historical values are considered for their preservation and conservation. These buildings play an important role in the history of the city of Kolkata in particular and shall be maintained properly. For this purpose, it has been realized that an inventory of such buildings, upon which the Heritage status has been conferred, is to be undertaken.	
11	Taking over management and control of Heritage Building	 If the Municipal Commissioner, on receipt of any information, is satisfied that the owner of a Heritage Building fails to preserve or conserve the Heritage Building, the Municipal Commissioner may, when the Heritage Building is vacant and after hearing the owner, by order in writing, take over the management and control of such Heritage Building for the purpose of preservation and conservation thereof, suspending the right of the owner to transfer such Heritage Building for a maximum period of five years, subject to acquisition either by agreement or under the provisions of the Land Acquisition Act, 1894 (1 of 1894). The Municipal Commissioner shall thereafter notify the Heritage Building for letting it out by agreement to any person as tenant for the purpose as aforesaid, and the owner shall be entitled to an amount equal to the reasonable letting value of the Heritage Building as rent less the cost on account of preservation and conservation of the Heritage Building. 	
12	Penalties	 Any person who destroys, removes, alters, defaces or misuses any Heritage Building or does any act, or abets in the commission thereof, shall be punishable with rigorous imprisonment for a term which may extend to three years and also with fine which may extend to fifty 	

Kolkata			
S. No.	Provisions	Regulations	
		 thousand rupees and, in default, with further rigorous imprisonment for six months. 2. Any court convicting any person under this section shall, by order, direct such person to restore the Heritage Building to its former shape and beauty at his cost, and any failure to comply with such order shall be deemed to be a continuing offence and such person shall be punishable with an additional fine of rupees two hundred and fifty for every day during which such contravention or failure continues after conviction for the first such contravention. 3. Where an offence under this section has been committed by a company, the provisions of section 619 shall apply 	
13	Incentives	 to such company. Transfer of right of development for the purpose of acquisition by agreement: When the owner of any Heritage Building is not willing to preserve or conserve any Heritage Building, the Municipal Commissioner may, for the purpose of acquisition of such Heritage Building by agreement and on the recommendation of the Heritage Conservation Committee and with the approval of the Mayor-in-Council, allow the transfer of right of development of such Heritage Building, which shall be heritable and transferable, to the owner of such Heritage Building in such manner, and subject to such conditions, as may be prescribed. Right of access to Heritage Building acquired by Corporation: Subject to such rules or regulations as may be made under this Act, every person shall have the right of access to any Heritage Building acquired by the Corporation. Sub-lease of Heritage Building: The Corporation shall have the right to allow the transfer of right of development to the lesse of a Heritage Building where the unexpired period of the term of lease is for 90 years, and to take the Heritage Building on sub-lease by agreement, if there is provision for such sub-lease in the deed executed between the owner and the lessee, provided that the question of payment of premium or rent in such case to the owner shall not, notwithstanding any agreement in this behalf, arise, and if the owner of a Heritage Building properly at his own expenses, the Corporation to maintain, preserve and conserve such Heritage Building properly at his own expenses, the Corporation may, in such case, exempt wholly or partly the owner of such premium or rent. 	

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Kolkata			
S. No.	Provisions	Regulations	
14	Owner's Responsibility	Every owner or occupier of any Heritage Building declared as such by the Corporation shall maintain, preserve and conserve it and shall not change its use in contravention of the provisions of this Act or the rules or the regulations made there under for its maintenance, preservation or conservation. Elements of the Building, which are not compatible with the whole or part of the Building, should be removed with the approval of Heritage Conservation Committee.	

Section 05 Findings from Howrah, West Bengal

Sections in Italics are verbatim from the Howrah Municipal Corporation Act, 1980.

	Howrah		
S. No.	Provisions	Regulations	
1	Institutional Framework	Heritage Conservation Committee.	
2	Grading/Listing	The gradation of a Heritage Building according to its historical, architectural, environmental or ecological purpose shall be such as may be prescribed.	
3	Selling or leasing out of the Heritage Property	The Corporation may acquire, purchase or take on lease any Heritage Building for the purpose of preservation and conservation thereof: Provided that in the case of a Heritage Building declared as such for the purpose of preservation and conservation as required under sub-clause (ii) of clause (a) of sub-section (4) of section 31 of the West Bengal Town and Country (Planning and Development) Act, 199, the approval of the concerned department of the State Government shall be taken	
4	Maintenance of Heritage Building	 Agreement with owner of Heritage Building pending acquisition: The Commissioner may, pending acquisition of a Heritage Building by the Corporation and with the approval of the Mayor-in-council, propose to the owner of the Heritage Building to enter into an agreement for a specified period for the maintenance of Heritage Building. Voluntary contribution and agreement with any voluntary organization, person or company: The commissioner may receive voluntary contributions towards the cost of maintaining any Heritage Building and may give order as to the management and application of such contributions for the purpose of preservation and conservation of Heritage Building. 	
5	Taking over management and control of Heritage Building	1. If the Commissioner, on receipt of any information, is satisfied that the owner of a Heritage Building fails to preserve or conserve the Heritage Building, the Commissioner may, when the Heritage Building is vacant and after hearing the owner, by order in writing, take over the management and control of such Heritage Building for the purpose of preservation and conservation thereof, suspending the right of the owner to transfer such Heritage Building	

Table 17: Findings from Heritage Protection Norms – Howrah

	Howrah		
S. No.	Provisions	Provisions Regulations	
		 for a maximum period of five years, subject to acquisition either by agreement or under the provisions of the Land Acquisition Act, 1894 (1 of 1894). 2. The Commissioner shall thereafter notify the Heritage Building for letting it out by agreement to any person as tenant for the purpose as aforesaid, and the owner shall be entitled to an amount equal to the reasonable letting value of the Heritage Building as rent less the cost on account of preservation and conservation of the Heritage Building. 	
6	Penalties	 Any person who destroys, removes, alters, defaces or misuses any Heritage Building or does any act or abets in the commission thereof, shall be punishable with rigorous imprisonment for a term which may extend to three years and also with fine which may extend to fifty thousand rupees and, in default, with further rigorous imprisonment for six months. Any court convicting any person under this section shall, by order, direct such person to restore the Heritage Building to its former shape and beauty at his cost, and any failure to comply shall be deemed to be a continuing offence and such person shall be punishable with an additional fine of rupees two hundred and fifty for every day during which such contravention or failure continues after conviction for the first such contravention. 	
7	Incentives	 Transfer of right of development : When the owner of any Heritage Building is not willing to preserve or conserve, the Commissioner may for the purpose of acquisition of such Heritage Building by agreement and on the recommendation of the Heritage Conservation Committee and with the approval of the Mayor-in- Council, allow the transfer of right of development of such building, which shall be heritable and transferable, to the owner of such Heritage Building in such manner, and subject to such conditions, as may be prescribed. Right of access to Heritage Building acquired by Corporation: Subject to such rules or regulations as may be made under this Act, every person shall have the right to access to any Heritage Building acquired by the Corporation. Sub-lease of Heritage Building: The Corporation shall have the right to allow the transfer of right of development to the lessee of a Heritage Building where the unexpired period of the term of lease is for 90 years, and to take the Heritage Building on sub-lease by agreement, if there is provision for such sub-lease in the deed executed between the owner and the lessee, provided that the question of payment of premium or rent in such case to the owner shall not, notwithstanding any agreement in this behalf, arise, and if the owner as confirming party to the agreement waives the right to receive any further payment of such premium or rent. Exemption of rates and taxes - If the owner of Heritage Building agrees to maintain, preserve and conserve at his own expenses, the Corporation may exempt wholly or partly the owner from payment of rates or taxes or fees for supply of water or any other charge in respect of such Heritage Building. 	
8	Owner's Responsibility	Every owner or occupier of any Heritage Building declared as such by the Corporation shall maintain, preserve and conserve it and shall not change its use in contravention of the provisions of this Act or the rules or the regulations made there under for its maintenance, preservation or conservation.	

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Section 06 Findings from Chandigarh

Sections in Italics are verbatim from the Chandigarh Master Plan - 2031.

Chandigarh				
S. No.	Pre	ovisions	Regulations	
1	Institutio	nal Framework	Expert Heritage Committee	
2	Grading/Listing		 Buildings, Campuses, and Natural Features, which have been listed for Heritage Status have been categorized as Heritage Zones, Heritage Precincts, and Heritage Buildings by the Expert Heritage Committee. 13 Zones have been shortlisted for Heritage status and graded in three categories. 	
	Grade I	Category	Buildings and Precincts of national or historic importance.	
		Scope for Changes	 No interventions be permitted either on exterior or interior. Essential and minimum changes allowed in conformity with the original, in the interest of strengthening and prolonging the life of the buildings/or precincts or any part or features thereof. 	
	Grade II	Category	Buildings and Precincts of regional or local importance.	
		Scope for Changes	No external change is to be permitted; however, only limited internal change is permitted which does not affect the exterior of the building.	
	Grade III	Category	Building and Precincts of importance for townscape.	
		Scope for Changes	 Internal changes may by and large be allowed. Changes can include extensions and additional buildings in the same plot or compound. 	

Table 18: Findings from Heritage Protection Norms – Chandigarh

Section 07 Findings from Nagpur

Sections in Italics are verbatim from the **Development Control and Promotion Regulations, 2018 for Nagpur Metropolitan Regional Development Authority** (Nagpur Metropolitan Area Development Plan), Urban Development Department, Government of Maharashtra.

Table 19: Findings from Heritage Protection Norms – Nagpur Metropolitan Area

Nagpur Metropolitan Area				
S. No.	Provisions		Regulations	
1	Grading/Listing		Grade I, II and III	
	Grade I	Category	Buildings and precincts of National or historic importance	

S. No.	Provi	sions	Regulations	
		Scope for Changes	 No interventions be permitted either on exterior or interior Absolutely essential and minimum changes, in the interest of strengthening and prolonging the life of the buildings or precincts. Repairs shall follow conservation norms based on international standards. 	
		(Development permission)	the Commissioner on the advice of the Heritage Conservation Committee to be appointed by the State Govt.	
		Category	Buildings and Precincts of regional and local importance	
	Grade II	Scope for Changes	 Grade-II (A): Internal changes and adaptive reuse and external changes may by and large be allowed but subject to strict scrutiny. Grade-II (B): In addition to the above, extension or additional building in the same plot or compound could, in certain circumstance; extension is not larger than the original building in terms of mass and scale. 	
		Procedure (Development permission)	Development permission for the changes would be given by the Municipal Commissioner on the advice of the Heritage Conservation Committee to be appointed by the State Government.	
	Grade III	Category	Buildings and Precincts of importance for townscape	
		Scope for Changes	External, internal changes and adaptive reuse would by and large be allowed. Changes can include extensions and additional buildings in the same plot or compound.	
		Procedure (Development permission)	Development permission for the changes would be given by the Municipal Commissioner on the advice of the Heritage Conservation Committee to be appointed by the State Government.	
2.	General Guidelines for development/ repairs etc. within Heritage area/ precinct/ asset/ building	Signage design and controls	Signs and outdoor display structures: 17.1 No display or advertising signs and outdoor display structures on listed buildings and/or the heritage precincts shall be permitted except in accordance with Part X (Signs and Outdoor Display structures) of the National Building Code of India. 17.2 Prohibition of advertising signs and outdoor display structures in certain cases: Notwithstanding the provisions of 14.1, no advertising sign or outdoor display structures shall be permitted on Buildings of Architectural, Aesthetic, Historical or Heritage importance as may be decided by the Municipal Commissioner, on the advice of the Heritage Conservation Committee or on Government buildings, save that in the case of Government buildings outdoor display structures may be permitted if they relate to the activities for the said buildings own purposes or related programs. Provided that if the Heritage Conservation Committee so advises, the Municipal Commissioner shall refuse permission for any signs or outdoor display structure.	

S. No.	Provisions	Regulations
	Skyline	Maintaining skyline and Architectural harmony: Buildings included in the Heritage Precincts or in the vicinity of Heritage sites shall maintain the skyline in the Precincts and follow the architectural style (without any high-rise or multi-storeyed development) as exists in the surrounding area, so as not to diminish the value and beauty or the view from the said Heritage Buildings/Heritage Precincts. The development within the precinct or in the vicinity of Heritage sites shall be in accordance with the guidelines framed by the Municipal Commissioner on the advice of the Heritage Conservation Committee.
3.	New construction/ Development/ Re-Development/ Addition/ Alterations or Extensions to Existing Structure	3. Restriction on development/re-development/repairs etc.: 3.1 No development or re-development or engineering operations or additions, alterations, repairs, renovations including the painting of buildings, replacement of special features or plastering or demolition of any part thereof of the said Listed Buildings or Listed Precincts or Listed Natural Features shall be allowed except with the prior written permission of the Municipal Commissioner.
		3.2 In relation to the religious buildings in the said lists, the changes, repairs, additions, alterations and renovations required on religious grounds mentioned in sacred texts, or as part of holy practices laid down in the religious codes may be treated as permissible, subject to their being in accordance and consonance with the original structure and architecture, designs, aesthetics and other special features thereof.
		3.3 In the case of Streets, Heritage Precincts, Areas and Natural Features notified as per the provisions of this Regulation, development permissions shall be granted in accordance with the special separate regulations prescribed for respective streets, precincts/natural features, areas which shall be framed by the Municipal Commissioner on the advice of the Heritage Conservation Committee.
		3.4 Provided that in exceptional cases, for reasons to be recorded in writing, the Municipal Commissioner may overrule the advice of the Heritage Conservation Committee. Provided further that the power to overrule the advice of the Heritage Commissioner shall not be delegated by the Municipal Commissioner to any other officer. Only in exceptional cases, for reasons to be recorded in writing, the Municipal Commissioner may refer the matter back to the Heritage Conservation Committee for reconsideration. The decision of the Heritage Conservation Committee after such a reference shall be final

	Nagpur Metropolitan Area			
S. No.	Provisions	Regulations		
4	Others	Restrictive Covenants: Restrictions existing as on date of this regulation imposed under covenants, terms and conditions on the leasehold plots either by the State Government or Municipal Corporation or by NIT shall continue to be imposed, in addition to Development Control Regulations. However, in case of any conflict between the Heritage Preservation Interest/Environmental Conservation, and the said Development Control Regulations, this Heritage Regulation shall prevail.		
		9. Power to alter, modify or relax other development		
		9.1 If there are any Development Plan/Master Plan reservations shown on Heritage Buildings and sites or on listed natural features the same shall not be implemented. If required, the Municipal Commissioner, on the advice of the Heritage Conservation Committee, shall move Government to get these reservations deleted/modified under Section 37 of the MRTP Act, 1966.		
		9.2 On the advice of the said Heritage Conservation Committee and for reasons to be recorded in writing, the Municipal Commissioner shall alter, modify or relax the provisions of other Development Control Regulations/Buildings Byelaws of Nagpur City (hereinafter referred to as 'the said Regulations') if it is needed for the conservation, preservation or retention of Historic and/or Aesthetic and/or cCltural and/or Architectural quality of any Listed Buildings/Heritage Buildings of Listed Precincts/Heritage Precincts and the preservation of any listed natural features and or environment		
		9.3 The Municipal Commissioner shall take all steps to ensure that the Listed Buildings and Precincts are demarcated on the Development Plan as soon as the Heritage List is published		
		9.4 During the preparation of the Development Plan, the Heritage Conservation Committee shall be consulted in order to ensure that no development proposal is planned on Heritage Buildings, sites or natural features and so as to ensure the protection of all Heritage Buildings, sites, precincts and natural features.		
5	Penalties	 6. Penalty for Unauthorized Development 6.1 Violation of the regulations shall be punishable under the provisions of the Maharashtra Regional and Town Planning Act, 1966 regarding unauthorized development. However, the amount of fine shall be decided by the Municipal Commissioner on the advice of the Heritage Conservation Committee. Any person who, whether at his own instance or at the instance of any other person commences, undertakes or carries out development without permission in a Heritage Building, site, precinct or a natural feature, or changes the use of the Heritage Building or site to commercial, shall on conviction, be punished with a fine which may extend to Rs. 50,000/- in addition to the cost of restoring the said Heritage Building and site to its original condition and form. On failure to comply, the person shall be punished with a fine 		

Nagpur Metropolitan Area

S. No.	Provisions	Regulations
		extending to Rs. 250 for every day during which such a contravention continues. The amount of fine shall be decided by the Municipal Commissioner on the advice of the Heritage Conservation Committee from time to time. 6.2 It shall be open to the Heritage Conservation Committee to consider a request for rebuilding/ reconstruction of a Heritage Building or part of a Heritage Building that was unauthorizedly demolished or damaged, if the Committee feels that it would enhance the Heritage Value of the Precinct or of a partially demolished Heritage Building. Provided that the total Built-Up area of the said building is not in excess of the total Built- Up area of the original Heritage Building.
6	Incentives	11. Incentive use of Heritage Buildings: In the case of buildings included in the Heritage Conservation List, if the owner/owners agree to maintain the listed Heritage Building as it is in the existing state and to preserve its Heritage state with due repairs and the owner/owners give a written undertaking to that effect, they may be allowed with the approval of the Heritage Conservation Committee to convert part or whole of the non-commercial area to commercial/office use. Provided that if the Heritage Building is not maintained suitably or if the Heritage Value of the Building is allowed to be spoiled in any manner, the Municipal Commissioner shall withdraw the permission forthwith. Listing does not prevent change of ownership or usage. However, such usage should be in harmony with the said Listed Precinct/Building.
		14. Heritage Conservation Fund: With a view to give monetary help for conservation/repairs of listed Heritage Buildings, a separate fund is to be constituted at the Municipal Corporation level within a period of six months after the publication of these regulations. Provision of such fund may also be made through District Planning and Development Council budget and which would be kept at the disposal of Municipal Commissioner, who would make disbursement from the funds on the advice of the Heritage Conservation Committee. The Municipal Commissioner may impose a special cess for the conservation of Heritage Buildings; provided that funds shall only be provided on the advice of the Heritage Conservation Committee.
		10. Grant of TDR: 10.1 If any application for development, alteration, modification of the Heritage Precincts or Listed Buildings is rejected under this Regulation or under the special regulations or while granting such permission any conditions are imposed on the owner which deprives him/her of use of the FSI, the said owner shall be compensated by grant of Development Rights Certificate.

	Nagpur Metropolitan Area			
S. No.	Provisions	Regulations		
		10.2 If the owners of Heritage Buildings agree to conserve their buildings and maintain them in a suitable manner, the Municipal Commissioner may, on the advice of the Heritage Conservation Committee, provide TDR to the owner. Provided, that the owner submits a conservation proposal to the Heritage Conservation Committee in the prescribed format. TDR shall only be provided on sanctioning of such a proposal by the Heritage Conservation Committee, and on receipt of a written undertaking by the owner in the prescribed format. Violation of the terms of the undertaking shall be punishable under the provisions of these regulations, and as per the provisions regarding unauthorized development in the Maharashtra Regional Town Planning Act, 1966.		
		10.3 The owner of the Heritage Precincts/Listed Buildings shall be entitled to use the said development rights in the city subject to conditions in the Development Rights Certificate and Regulations as may be prescribed by the Government from time to time. The extent of TDR certificate to be granted may be determined by the Commissioner, Nagpur Municipal Corporation in consultation with the Heritage Conservation Committee.		
7	Owner's Responsibility	4. Responsibility of the owners of Heritage Building: It shall be the duty of the owners/occupants including tenants of heritage buildings and of Buildings in Heritage Precincts to carry out regular repairs and maintenance of the buildings at their own cost after prior approval of the Heritage Conservation Committee, and shall not change their use in contravention of the Heritage regulations. It shall be the responsibility of the Local Authorities/State Government and Central Government to maintain the Listed Buildings owned by these authorities so as to fully preserve their Heritage Value.		
8	Mechanism for sanction	 5. Procedure for Obtaining Permission: 5.1 Every person who intends to carry out any development or conservation/preservation/restoration/renovation of a Heritage Building or within a Heritage Precinct shall give notice in writing to the Heritage Conservation Committee in the prescribed format, and this application shall be accompanied by the plans and reports as required under Section 35* of the DC Rules. * DC Rule 35 should include the sanctioning procedure, which we have submitted earlier. 5.2 The Heritage Conservation Committee shall scrutinize the proposal and may grant sanction or refuse the proposal, provided that before doing so the Committee shall provide a hearing to the applicant, and to any persons who may have submitted suggestions/objections in relation to the said proposal. While sanctioning or refusing sanction, the Heritage Conservation Committee shall provide a written justification for its decision. If within 60 days the Heritage Conservation Committee fails to intimate in writing to the applicant of its refusal or sanction with such modifications or directions, the proposal shall be deemed to have been sanctioned, provided that the proposal is strictly in conformity with the Conservation Guidelines formulated by 		

Nagpur Metropolitan Area				
S. No.	Provisions	Regulations		
		the Heritage Conservation Committee, Bye-Laws, Regulations in force, and no development is carried which will cause damage to any Heritage Building, Heritage site or Natural Feature.		

Index

I. Abbreviations

1.	AMASR, 1958	:	Ancient Monuments and Archaeological Sites and Remains Act, 1958
2.	AMASR, 2010	:	Ancient Monuments and Archaeological Sites and Remains Act, 2010
3.	ARD	:	Air Rights Development
4.	ASI	:	Archaeological Survey of India
5.	BG	:	Broad Gauge
6.	BOD	:	Board of Directors
7.	BUA	:	Built-up Area
8.	CCP	:	Comprehensive Conservation Plan
9.	CTRL	:	Channel Tunnel Rail Link
10.	DDA	:	Delhi Development Authority
11.	EIC		East India Company
12	FIR		East India Railway
13	Fol		Expression of Interest
14	ESI	:	Eloor Space Index
15	GDCR	:	General Development Control Regulations
16	GOL	:	Government of India
10.		:	Heritage Asset
10		:	Horitage Associate Popart
10.		÷	Heritage Assessment Report
19.		•	
20.	HUU	:	Heritage Conservation Committee
Z1.	HCRP	:	Heritage Conservation and Reuse Plan
22.	HG	:	Halt stations
23.	HIA	:	Heritage Impact Assessment
24.	HMMP	:	Heritage Management and Maintenance Plan
25.	HMPVC	:	Handbook for Master Planning and Value Creation
26.	HRAP	:	Heritage Railway Advertisement Policy
27.	HRC	:	Heritage Regulation Card
28.	HSB	:	Historic Station Building
29.	HVAC	:	Heating, Ventilation, and Air Conditioning
30.	ICOMOS	:	International Council on Monuments and Sites
31.	IMMR	:	Inspection, Maintenance, Monitoring and Repair
32.	INTACH	:	Indian National Trust for Arts and Cultural Heritage
33.	IR	:	Indian Railways
34.	IRSDC	:	Indian Railway Stations Development Corporation
35.	ISBT	:	Inter State Bus Terminal/ Inter-State Bus Terminus
36.	IUCN	:	International Union for Conservation of Nature
37.	Jn.	:	Junction
38.	KMC	:	Kolkata Municipal Corporation
39.	MCA		Model Concession Agreement
40.	MCD		Municipal Corporation of Delhi
41	MCGM		Municipal Corporation of Greater Mumbai
42	MEP		Mechanical Electrical and Plumbing
43	MG	:	Metre Gauge
40. ΔΔ	MHCC	:	Mumbai Heritage Conservation Committee
44. 15	MoEF&CC	:	Ministry of Environment, Forest and Climate Change
40. 46		:	Ministry of Housing and Urban Affaire
40. 47	MoR	:	Ministry of Pollwovo
47. 10		:	Ministry of Lirban Davidanment
40.		:	Ministry of Orban Development Mester Den for Delhi
49.			Master Plan for Deini Maste Denid Transit Custom
50.	MADOD	:	iviass kapio Transit System
51.	MSRCD	:	ivianuais for Station Redevelopment including Commercial Development
52.	MSSR	:	Manual of Standards and Specifications for Railway Stations 2009
53.	NBC	:	National Building Code 2016
54.	NDMC	:	New Delhi Municipal Council
55.	NG	:	Narrow Gauge

56. 57. 58. 59.	NMA NPS NSG NSW	: : : :	National Monuments Authority National Park Service (United States) Non-Suburban Stations New South Wales National Transit Oriented Development
61 61		:	Object of Significance
62		:	Outstanding Universal Values
63		:	Property Development Card
67 67		:	Project Information Memorandum
65 65		:	Plan Sanctioning and Monitoring Committee
66 66	RA 1989		Railway Act 1989
67	RHA	:	Railway Heritage Asset
68	RIDA	:	Rail Land Development Authority
69	SG		Suburban Stations
70.	SoC	:	State of Conservation
71.	SOP	:	Standard Operating Protocol
72.	SSEF	:	Shakti Sustainable Energy Foundation
73.	TC	:	Technical Consultant
74.	TCPO	:	Town and Country Planning Organisation
75.	TDR	:	Transferable development rights
76.	TOD	:	Transit Oriented Development
77.	ToR	:	Terms of Reference
78.	UBBL	:	Unified Building Bye-Laws 2016
79.	ULB	:	Urban Local Body (ies)
80.	UNESCO	:	United Nations Educational, Scientific and Cultural Organization
81.	WH	:	World Heritage
82.	WHC	:	World Heritage Convention
83.	WHP	:	World Heritage Property

II. Definitions of Terms Used

	Term	Definition
	Adaptive Reuse/ Continued Use	Adaptive Reuse/ Continued Use of RHA refer to the process of re-use/ continued use/ new use proposed for an RHA which is suitable to its intrinsic value, does not damage the heritage values of the asset and is compliant with all required policies, standards and guidelines for Conservation and Management of the Heritage Asset.
1.	Archaeological Site and Remains	Archaeological Site and Remains shall have the same meaning as defined in the AMASR Act'2010.
2.	Authenticity	Authenticity shall have the same meaning as defined in the updated Operational Guidelines of the World Heritage Convention' 72.
3.	Condition Assessment	 Condition Assessment shall be the statement reporting the actual state of RHA achieved through scrutiny of the built fabric, study of history of defect, quality of intervention, non-destructive and where necessary destructive testing et al and be conveyed through Condition Mapping and Report. <i>For the purpose of this definition, the Explanatory note is as below:</i> a) The report comprising Condition Assessment shall detail out: b) Building pathology, grading of defects, defining nature of actions. c) Identify and Prioritize interventions/ conservation works. d) Establish Degree of Adaptability and Life Cycle Cost. e) Inform developing estimates, in identifying specifications, project management and monitoring schedules for implementation. f) Identify trends affecting significance and potential opportunities (assist in future planning). g) Identify skills needed for implementation and quality (and impact of) previous interventions.
4.	Condition Mapping	Condition Mapping shall mean a tool for systematic graphical recording of the types (active and passive) of pathological, mechanical, and any causes that lead to deterioration of the RHA and shall supplement Condition Assessment. <u>For the purpose of this definition, the Explanatory note is as below:</u> Condition Mapping shall be expressed in the form of drawings, images, photographs, diagrams et al best representing one's observations of SoC. Condition Mapping undertaken based on visual observations shall only be a starting point for Condition Assessment and follow-up action and shall always be supplemented with non-destructive testing.
4.	Conservation area	Conservation area shall mean an area that includes built or natural assets that are recognized for its significant aesthetic, social, ecological, environmental, or spiritual contribution at local, regional or national level or to the Railways itself. <u>For the purpose of this definition, the Explanatory note is as below:</u> Conservation Area may include natural and man-made contexts, viewpoints, groups of buildings, structures and open spaces including archaeological and paleontological sites, constituting human settlements in an urban or rural environment, historic towns, old urban quarters, villages as well as homogeneous monumental groups.
5.	Contributory Features, Assets and Resources	Contributory Features, Assets and Resources shall mean those significant built or natural components in the precinct of the Railway Station Area that are characteristic to a place, community or region, that may comprise features of the HA or amplifying the values of the Railway HA or may demonstrate the evolution of the context. For the purpose of this definition, the Explanatory note is as below: 'Contributory' elements, features or resources are typically externally intact, but may have visible changes which do not detract from the contribution to the Heritage Area.
υ.	landscapes	represent the values of a community(ies) because of human interaction with

	Term	Definition
		 the environment. The emphasis in a Cultural Landscape is the ability of the asset to demonstrate the interrelationship as well as the results of it. For the purpose of this definition, the Explanatory note is as below: A set of ideas and practices embedded in an area or a place that demonstrate the relationship between intangible and tangible heritage. The term "cultural landscape" embraces a diversity of manifestations of the interaction between humankind and the natural environment. Cultural landscape is applied to areas of landscape including landscapes where natural features have special meanings to people, to highly modified or developed landscapes. Such lands may have continuing use or may be a collection of extant remains. There are three broad categories of Cultural landscapes, namely: Landscape designed and created intentionally by man - A defined and designed landscape intentionally created (by man). These range from gardens and parklands, landscapes constructed for aesthetic purposes which may or may not be associated with spiritualism or other monumental buildings and ensembles. Organically evolved landscape - An organically evolved landscape that are a result of an initial social, economic, administrative, and/or religious imperative and has developed its present form by association with and in response to its natural environment. Such landscapes reflect that process of evolution in their form and component features and can be classified as follows: <u>relict (or fossil) landscape</u> - is one where an evolutionary process concluded abruptly or over a period of time. Its significant distinguishing features are visible in material form. <u>continuing landscape</u> - is one which retains an active social role in contemporary society and is associated with the traditional way of life, and in which the evolutionary process is still in progress and are exhibited through significant material evidence.
7.	Degree of Adaptability	Degree of Adaptability shall mean the acceptable limits or degree or range or extent of proposed change that may be permitted so that it does not undermine the integrity of the RHA or lessens its Life Cycle.
8.	Documentation	Documentation shall mean a comprehensive record of features and details presented in the form of drawings, photographs, videos or any other suitable media that conveys all information about a RHA comprehensively.
9.	Heritage Area	Heritage Area shall mean a defined buffer around a protected or unprotected structure, precinct or area that may include protected views, Contributing and Non-Contributing Features. For the purpose of this definition, the Explanatory note is as below: A Heritage Area is a designated conservation area characterized by an ensemble of built volume and unified by similar use, architectural style, association, or historical development. In such areas, development is regulated to compliment and accentuate the Heritage Assets. Individual Heritage Assets in such areas may or may not be under a single owner/ agency. The boundaries of the Heritage Area identified as a part of this project may or may not be the same as a Heritage Zone(s) identified in Master Plan/ Zonal Plans. Where the lines coincide with the provisions of Policy and Guidelines for Railway Heritage Assets that apply over and above those in the Master Plan/Zonal Plan.

	Term	Definition
10.	Heritage Railways	Heritage Railways may include historic or preserved railways, museum railways, working railways, tramways, tram museums and tourist railways, and may extend to heritage trains operating on the national network and other railways.
11.	Heritage Zone	Heritage Zone shall mean a Conservation Area which is designated as such by a local planning authority or delineated in the Master Plan / Zonal Plan because it is of special architectural or historical interest the character of which ought to be preserved.
12.	Historic Environment	Historic Environment shall mean the characteristic physical environs of the Heritage Assets having built and natural features that influence the static or dynamic way(s) the area is perceived, experienced, and enjoyed and shall include Contributing and Non-Contributing Feature(s), Asset(s), or Resource(s). <u>For the purpose of this definition, the Explanatory note is as below:</u> Historic Environment may include natural and man-made contexts, viewpoints, groups of buildings, structures and open spaces including archaeological and paleontological sites, constituting human settlements in an urban or rural environment, historic towns, old urban quarters, villages as well as homogeneous monumental groups. The functions of features and assets included in the Historic Environment may greatly vary from the Railway Heritage Asset.
13.	Intangible Heritage Asset	Intangible Heritage Asset shall encompass traditions, practices, representations, expressions, knowledge, skills, crafts, folklore – as well as instruments, objects, artefacts, and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural identity and is associated to RHA. For the purpose of this definition, the Explanatory note is as below: Intangible cultural heritage, transmitted from generation to generation, is constantly recreated by community(ies) in response to their environment. Their interaction with nature, their history, it provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.
14.	Integrity	Integrity shall have the same meaning as defined in the Operational Guidelines of the World Heritage Convention' 72.
15.	Inventory	Inventory shall mean an updated dossier of comprehensive and detailed information and records like images, drawings etc., associated history, building archaeology, significant features, legal documents, ownership and revenue data, maintenance and conservation history, vulnerabilities et al. <u>For the purpose of this definition, the Explanatory note is as below:</u> An inventory may be preceded by a Listing. The inventory is intended to be kept updated, to support preparation of PIM and shall be the basis of decision-making, inform maintenance regime and guide mobilization of funds and programs. Such information supports tourism, outreach, develop marketing strategy and brand building. Inventory shall have pictorial and written documentation conveying the significance of the RHA and features, including building's history, physical aspects like mass, volume, setting, composition, proportion, scale, color, texture, materials, features, craftsmanship, window arrangements, colors, setting and interiors et al are critical for a fruitful project. Therefore, identifying features that make the historic character and planning, in-keeping with its scope and limitations shall determine effectiveness and impact of a proposal and technical soundness of plans emanating from it.
16.	Life Cycle Assessment	Life-Cycle Assessment shall mean the valuation of the RHA including initial investments (conservation), costs that occur during its service life
		(maintenance, management, and operations) and the social appreciation of the RHA and shall support determining the Degree of Adaptability.

	Term	Definition
17.	Listing	Listing shall mean a comprehensive list/ catalogue comprising all components and features that together convey the SoS of RHA. For the purpose of this definition, the Explanatory note is as below: It is essentially a list that conveys categories of RHA. It is a checklist for quick reference from project conceptualization, evaluation, monitoring et al. but shall not be the sole basis for decision-making.
18.	Mapping	Mapping shall mean a systematic, scientific, and authentic documentation of all-important resources and values within an area in a geospatial format and linked to a BIM database. For the purpose of this definition, the Explanatory note is as below: Mapping shall show the evolution, transformation of RHA, issues affecting it across time, depict loss of heritage and document impact of planning and development. It combines two- and three-dimensional information. It supports the Listing and Inventory databases by assimilating data from multiple sources for area- level planning, communication to different departments/ users, conservation, projects monitoring and management. It also is a ready information source for inventory of land records for revenue related and other allied purposes.
19.	Non-contributing element or resource	Non-contributing Asset shall mean any element, resource, building, site, structure, or object that does not add to the historical associations, historical architectural qualities, or archaeological values for which a property is significant for.
20.	Railway Heritage Asset	Railway Heritage Asset (RHA) shall mean all part components of the Railway system involved in the operational and non-operational functioning since the inception of the Railways. <u>For the purpose of this definition, the Explanatory note is as below:</u> RHA shall include, but not be limited to historic railways, tourist railways, tramways, railway museums, historic fixed and rolling stocks, canals, housing, fixed and moving structures and equipment currently in use or otherwise (for example, archival material, drawings, designs and prototype models) and have a direct or indirect role in functioning or operating of the Railways system.
21.	Skyline	Skyline means the profile of buildings as seen from a distance as defined against the sky.
22.	State of Conservation	State of Conservation (SoC) shall mean a conclusive statement indicative of condition of RHA conveyed through a combination of graphical and textual format and shall govern maintenance and management regime of RHA. The SoC is to be written on the basis of detailed studies and analysis of the RHA <i>For the purpose of this definition, the Explanatory note is as below:</i> SoC comprises two parts - Condition Assessment and Condition Mapping.
23.	Statement of Significance	Statement of Significance (SoS) shall mean the content conveying how, why, and what is the importance of and important in the RHA. The SoS is to be written on the basis of detailed studies and analysis of the RHA SoS shall be the basis on which decisions are made regarding the identification of RHA and means of ensuring its continuity. It shall also be the basis for developing a resource-specific maintenance, protection, and management regime.
24.	Substitute materials	Substitute materials shall mean those products used to imitate historic materials and whose properties shall match the appearance and physical properties of historic materials it is replacing.

III. Combined References and Bibliography for 06a: Working Policy for RHA, 06b: Guidebook for Conservation of RHA and 06c: Background Studies for Working Policy and Guidlines

A. References for historical planning and evolution study

- 1. IRFCA the Indian Railways Fan Club. (2010-2019). Retrieved August 12, 2019, from https://www.irfca.org/faq/faq-hist.html
- BUILDING MATERIALS AND TECHNOLOGY PROMOTION COUNCIL. (1990). Retrieved August 20, 2019, from Earthquake Hazard Map http://bmtpc.org/DataFiles/CMS/file/VAI2019/MAP/eqmap/EQ_JPG/EQ_INDIA.jpg: http://bmtpc.org/topics.aspx?mid=56andMid1=178
- 3. Central Railway. (2016). Retrieved August 20, 2019, from Central Railway System Map https://cr.indianrailways.gov.in/cris//uploads/files/1503902958792-A4%20Eng%20and%20Hindi%202017.pdf: https://cr.indianrailways.gov.in/index.jsp
- Chapter 23: Customer Satisfaction. (1988). In G. Khosla, A History of Indian Railways. New Delhi: Ministry of Railways (Railway Board), Government of India and Y.P. Chopra of AH Wheeler and Co., (P) Ltd.
- 5. Chapter 5: An Economy of Suffering, The Ethics of Popular Nationalism in Petitions from Railway Workers, 1930-1947. (2007). In L. Bear, Lines of the Nation: Indian Railway Workers, Bureaucracy, and the Intimate Historical Self. New York Chichester, West Sussex: Columbia University Press.
- 6. Chapter 3: Governing the Railway Family,1860-1900. (2007). In L. Bear, Lines of the Nation: Indian Railway Workers, Bureaucracy, and the Intimate Historical Self. New York Chichester, West Sussex: Columbia University Press.
- 7. Chapter 2: An Indian Traveling Public,1850-1900. (2007). In L. Bear, Lines of the Nation: Indian Railway Workers, Bureaucracy, and the Intimate Historical Self (p. 36). New York Chichester, West Sussex: Columbia University Press.
- 8. East Central Railway. (2016). Retrieved August 20, 2019, from https://ecr.indianrailways.gov.in/uploads/files/1467613236808-system%20map(final).pdf: https://ecr.indianrailways.gov.in/index.jsp
- 9. Eastern Railway. (2016). Retrieved August 20, 2019, from https://er.indianrailways.gov.in/view_section.jsp?fontColor=blackandbackgroundColor=LIGHTSTEELBL UEandlang=0andid=0,1: https://er.indianrailways.gov.in/
- 10. Introduction, Kharagpur and its Discontents. (2007). In L. Bear, Lines of the Nation: Indian Railway Workers, Bureaucracy, and the Intimate Historical Self (pp. 4-6). New York Chichester, West Sussex: Columbia University Press.
- 11. IRFCA, the Indian Railways Fan Club, The Indian Midlands. (2010-2019). Retrieved August 20, 2019, from https://www.irfca.org/articles/manning/gwalior.html
- 12. IRFCA, the Indian Railways Fan Club. (2010-2019). Retrieved August 20, 2019, from https://www.irfca.org/faq/faq-history2.html
- 13. IRFCA, the Indian Railways Fan Club. (2010-2019). Retrieved August 20, 2019, from IR History: Early Days II https://www.irfca.org/faq/faq-history2.html: https://www.irfca.org/index.html
- 14. IRFCA, the Indian Railways Fan Club. (2010-2019). Retrieved August 20, 2019, from IR History: Part III (1900 1947) https://www.irfca.org/faq/faq-history3.html: https://www.irfca.org/index.html
- 15. North Central Railway. (2016). Retrieved August 20, 2019, from North Central Railway, The Allahabad Division: https://ncr.indianrailways.gov.in/uploads/files/1506076825321-System%20map%202017%20A4%20Final.pdf
- 16. North East Frontier Railway. (2016). Retrieved August 20, 2019, from System Map of Tinsukia Division, https://nfr.indianrailways.gov.in/uploads/files/1489553486174-
 - 1.SYSTEM%20MAP%20OF%20TINSUKIA%20DIVISION.pdf: https://nfr.indianrailways.gov.in/
- 17. Northern Railway Ambala Division. (2016). Retrieved August 20, 2019, from https://nr.indianrailways.gov.in/view_section.jsp?lang=0andid=0,1,263,314,319: https://nr.indianrailways.gov.in/index.jsp
- 18. Northern Railway Delhi Division. (2016). Retrieved August 20, 2019, from https://nr.indianrailways.gov.in/view_section.jsp?lang=0andid=0,1,263,314,315: https://nr.indianrailways.gov.in/index.jsp
- 19. Northern Railway Firozpur Division. (2016). Retrieved August 20, 2019, from https://nr.indianrailways.gov.in/view_section.jsp?lang=0andid=0,1,263,314,318: https://nr.indianrailways.gov.in/index.jsp

- 20. Northern Railway Lucknow Division. (2016). Retrieved August 20, 2019, from https://nr.indianrailways.gov.in/uploads/files/1473249960206-LKO%20INTRO.pdf: https://nr.indianrailways.gov.in/index.jsp
- 21. Northern Railway Moradabad Division. (2016). Retrieved August 20, 2019, from Moradabad Division Divisional System Map https://nr.indianrailways.gov.in/view_section.jsp?lang=0andid=0,1,263,314,317: https://nr.indianrailways.gov.in/index.jsp
- 22. South Central Railway. (2016). Retrieved August 20, 2019, from South Central Railway System Map, https://scr.indianrailways.gov.in/scr/personal/1563866329793_SCR_System_map_2019.pdf: https://scr.indianrailways.gov.in/index.jsp
- 23. South Eastern Railway. (2016). Retrieved August 20, 2019, from https://ser.indianrailways.gov.in/uploads/files/1565953545420-SYSTEM%20MAP.jpg: https://ser.indianrailways.gov.in/
- 24. South Western Railway. (2016). Retrieved August 20, 2019, from https://swr.indianrailways.gov.in/view_section.jsp?lang=0andid=0,1,261,293,510: https://swr.indianrailways.gov.in/index.jsp
- 25. West Central Railway. (2016). Retrieved August 20, 2019, from https://wcr.indianrailways.gov.in/uploads/files/1389007892291-Microsoft%20Word%20-%20JBP.pdf: https://wcr.indianrailways.gov.in/
- 26. Western Railway. (2016). Retrieved August 20, 2019, from Mumbai Division, https://wr.indianrailways.gov.in/view_section.jsp?lang=0andid=0,5,571: https://wr.indianrailways.gov.in/index.jsp

B. Heritage Conservation: Standards and Guidelines

- 1. Australia ICOMOS Charter for the Conservation of Places of Cultural Significance
- 2. California Department of Parks and Recreation California Office of Historic Preservation (OHP)
- 3. Conservation Principles (2018), Historic England
- 4. Conservation Register Handbook (2018), RIBA
- 5. Conservation Turn Return to Conservation, Tolerance for Change, Limits of Change (2011) ICOMOS
- 6. Coulls, A. (1999). Railways as World Heritage Sites. Paris: ICOMOS (International Council on Monuments and Sites).
- 7. Design Guidelines for Additions and Alterations, City of Georgetown
- 8. Environment A States of Guernsey Government Department (2011)
- 9. Integrated Territorial and Urban Conservation, ITUC, Programme Phase I (1994 1998), ICCROM
- 10. National Parks Service, U.S. Department of the Interior. Preservation Briefs, 2007.
- 11. Operational Guidelines of the World Heritage Convention, UNESCO
- 12. The Building Conservation Directory (2015)
- 13. The Prince's Regeneration Trust (2009)
- TICCIH The International Committee for the Conservation of the Industrial Heritage. (2012). Industrial Heritage Re-tooled: The TICCIH guide to Industrial Heritage Conservation. Lancaster, England: Carnegie Publishing Ltd.
- 15. Values and Heritage Conservation (2000), The Getty Conservation Institute

C. Information Management: Standards and Guidelines

- 1. Short Guide: Applied Digital Documentation in the Historic Environment (2018), The Engine Shed
- 2. Condition Assessment Documentation (2005), The Getty Conservation Institute
- 3. Recording, Documentation, and Information Management for the Conservation of Heritage Places (2007), The Getty Conservation Institute
- 4. Municipal Heritage Inventory (2011), The Shire of Denmark
- 5. Guidance Note for Inventorying Intangible Cultural Heritage (2003), UNESCO-ICH
- 6. Secretary of the Interior's Standards and Guidelines | HABS/HAER/HALS
- 7. Federal Register/Vol. 68, No. 139/Monday, July 21, 2003/Notices
- 8. Cultural Heritage Repositories: Digital Archives for Conservation and Management, The World Heritage UNESCO
- 9. Architectural Heritage: Inventory and Documentation Methods in Europe (1992), Council of Europe
- 10. Applied Digital Documentation in the Historic Environment (2018), Historic Environment Scotland
- 11. MIDAS Heritage The UK Historic Environment Data Standard (2012), English Heritage
- 12. Instructions for Recording Historical Resources (1995) National Park Service, Department of the Interior
- 13. Software for data integration Apatar and TiddlyWiki
- 14. Built Information Modelling for the 3D Reconstruction of Modern Railway Stations (2019), Heritage Journal
- 15. National Parks Service, U.S. Department of the Interior. Preservation Briefs, 2007.
- 16. Meredith Sykes, Manual on systems of inventorying immovable cultural property (1984), UNESCO
- 17. Survey Brief for Madhya Pradesh Monuments Project, Government of Madhya Pradesh, Department of Culture and World Monuments Funds Partnership, World Monument Funds.
- 18. U.S. Department of the Interior, National Park Services, Recording Historic Structures and Sites for the Historic American Engineering Record, Heritage Documentation Programs.
- 19. U.S. Department of the Interior, National Park Services (2008), HABS Guidelines, Recording Historic Structures and Sites with HABS Measured Drawings, Washington DC.
- 20. U.S. Department of the Interior, National Park Services (2005), Historic American Landscapes Survey Guidelines for Drawings, Historic American Landscapes Survey.
- 21. I Akbaylar; Turan M (2011), Documentation of historic structures for the assessment of heritage characteristics, Journal of Architectural and Planning Research 28:2, USA.
- 22. Drafting Standards, National Park Services (https://www.nps.gov/dscw/cad-drafting.htm).

D. Maintenance, Management and Protection: Standards and Guidelines

- 1. Heritage Asset Management Strategy (2013-2018), Australian Technology Park Sydney Limited
- 2. Preservation Maintenance: A Universal Manual for developing Conservation Maintenance Plans (2006), The City of Steamboat Springs
- 3. Managing Visitor Safety in The Historic Built Environment: Principles and Practice (2015), VSCG, Historic Built Environment Subgroup
- 4. Cyclical Maintenance Manual for Historic Bartram's Garden (2011), Heritage Consulting Inc.
- 5. Guide for the Structural Rehabilitation of Heritage Buildings (2010), CIB Commission
- 6. Heritage Building Maintenance Manual: Manitoba, Canada's Historic Places
- 7. Heritage Information Series: How to Carry Out Work on Heritage Buildings and Sites (2002), NSW Heritage Office
- 8. Management Guidelines for World Cultural Heritage Sites (1998) ICCROM
- 9. Guidelines for preparing Heritage Impact Statements, Heritage Victoria, Office of Environment and Heritage (NSW)
- 10. Outdoor Advertising Control Practices in Australia, Europe, and Japan (2011), the U.S. Department of Transportation's Federal Highway Administration in cooperation with the American Association of State Highway and Transportation Officials and the National Cooperative Highway Research Program
- 11. Conservation Management Plans: A guide, Heritage Lottery Fund
- 12. Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (2011), ICOMOS,
- 13. Statements of Heritage Impact, Heritage Council, NSW Heritage Office.
- 14. Assessing heritage significance (2011), Heritage Council, NSW Heritage Office.
- 15. Standards for evaluating significance within registered historic districts, Parks, Forestry and Public Property, Electronic Code of Federal Regulations (e-CFR), Legal Information Institute.
- 16. Jukka Jokilehto, Considerations on Authenticity and Integrity in the World Heritage Context, ICOMOS.
- 17. Rob Geraedts, FLEX 4.0, A Practical Instrument to Assess the Adaptive Capacity of Buildings(2016), Energy Procedia 96:568–579.
- 18. Cultural Resources Climate Change Strategy (2016), National Park Service U.S. Department of the Interior.
- 19. Marta Bottero, Chiara D'Alpaos and Alessandra Oppio, Ranking of Adaptive Reuse Strategies for Abandoned Industrial Heritage in Vulnerable Contexts: A Multiple Criteria Decision Aiding Approach (2019).
- 20. William F. Baker and Richard F. Tomlinson II, Bridging the Tracks: Air Rights Development and the Urban Fabric (2012), MAS Context.
- 21. Karen Cilento, The New York High Line officially open (2009), ArchDaily.
- 22. Millennium Park, Urban Transformation, 2009 Rudy Bruner Award for Urban excellence (2009).
- 23. National Parks Service, U.S. Department of the Interior. Preservation Briefs, 2007.

E. Risk Assessment and Management: Standards and Guidelines

- 1. Guidelines for Managing Post-Disaster Conservation of Heritage Buildings (2011), Indonesian Heritage Trust
- 2. Built Heritage Risk Assessment and Preparedness Strategies, Cultural Heritage without Borders (CHWB)
- 3. Risk Preparedness: A Management Manual for World Cultural Heritage (1998), ICCROM
- 4. Building conservation Risk Management Statement (2011), The National Gallery
- 5. The ABC Method: A Risk Management Approach to The Preservation of Cultural Heritage (2016) Canadian Conservation Institute, ICCROM
- 6. Managing fire safety in historical buildings, CFPA-E Guideline No 30:2013 F
- 7. A Guide to Risk Management of Cultural Heritage (2016), ICCROM, Government of Canada, Canadian Conservation Institute

F. Incentives, Policies and Fiscal Measures: Standards and Guidelines

- 1. Incentives and Policy Tools for Conserving Our Historic Heritage (2004), National Incentives Taskforce for the Environment Protection and Heritage Council (EPHC).
- 2. Conditional exemption and Heritage Management Plans: An introduction for owners and their advisers, Natural England, Historic England.
- 3. A review of fiscal measures to benefit heritage conservation (2007), Findings in Built and Rural Environments (FiBRE).
- 4. The Value of Cultural Assets: Maintenance Costs and Economic Sustainability of Heritage (2011), XII DBMC, Porto, Portugal.
- 5. Transfer of Development Rights, Pennsylvania Land Trust Association.
- 6. Life–Cycle Maintenance Cost Implications of Heritage Properties: Valuation Challenges and Opportunities for Further Research (2014).
- 7. Malraux Act' 1962.
- 8. Biodiversity Offsets, Issues Brief, IUCN.
- 9. How the Biodiversity Offsets Scheme works, Biodiversity Offsets Scheme, NSW Government, Australia.

G. Assessment Reports

- 1. Mapping of current heritage re-use policies and regulations in Europe: Complex policy overview of adaptive heritage re-use (2019), Open Heritage, European Union (EU) Horizon 2020
- 2. Environmental Statement, Vol. 1 and 2 (2004), King's Cross Central, London
- 3. King's Cross Central, Main Site Development Specification: Specification of Works to Retained Historic Buildings and Structures

H. Indian Acts, and Normative Framework:

- 1. The Ancient Monuments and Archaeological Sites and Remains Act, 2010
- 2. Guidelines for Listing of Built Heritage, INTACH Listing Cell
- 3. Manual for Standards and Specifications for Railway Stations (2009), Ministry of Railways, Government of India
- 4. Model Building Byelaws (2016), Town and Country Planning Organisation
- 5. Model Heritage Regulations (2011), TCPO, Ministry of Urban Development
- 6. URDPFI Guidelines, 2014. Volume I and II A, TCPO, Ministry of Urban Development
- 7. Jawaharlal Nehru National Urban Renewal Mission, Ministry of Urban Development, Government of India
- 8. Comprehensive Conservation Plan for Hampi, The World Heritage
- 9. Railway Heritage: Indian Railways (2019), INTACH

I. Ahmedabad's Normative Framework:

- 1. The Gujarat Government Gazette 2016, Ahmedabad Municipal Corporation
- 2. Comprehensive Development Control Regulations 2017, UD and UHD, Govt. of Gujarat
- 3. Listing and Grading of Heritage Structures, Ahmedabad Urban Development Authority (2016) INTACH-Gujarat and Urban Management Centre

J. Mumbai's Normative Framework:

- 1. Development Control Regulations for Greater Bombay, 1991
- 2. Maharashtra Regional and Town Planning Act, 1964
- 3. Proposed modification to the existing Heritage List and additional listing of structures / sites / Precincts from City, Western Suburbs and Eastern Suburbs; to be included as supplement to the existing Heritage List (2011), Municipal Corporation of Greater Mumbai
- 4. Sanction to the Heritage list of A ward under regulation 52(4) of Development Control and Promotion Regulations 2034 for G. Mumbai, Maharashtra Regional and Town Planning Act, 1964

K. Chandigarh's Normative Framework:

- 1. Chandigarh Master Plan 2031
- 2. Chandigarh Building Rules (Urban) 2017
- 3. Conservation Management Plan for Gandhi Bhawan, Panjab University (2017), Prepared by DRONAH for the Panjab University, Chandigarh under Keeping it Modern Grant by The Getty Foundation

L. Delhi's Normative Framework:

- 1. Unified Building Bye Laws for Delhi (2016), Delhi Development Authority
- 2. Master Plan for Delhi 202, Delhi Development Authority
- 3. Delhi Development Act 1957

M. Kolkata's Normative Framework:

1. The Howrah Municipal Corporation Act, 1980

2. Kolkata Municipal Corporation Act, 1980

N. Jaipur's Normative Framework:

- 1. Jaipur (Walled City) Heritage Conservation and Protection Regulations-2020
- 2. Unified Building Bye Laws for Delhi (2017), Rajasthan Gazette

O. Nagpur's Normative Framework:

- 1. Draft of modified Heritage Regulations for Nagpur (2009), Vidarbha Heritage Society
- 2. Development Control and Promotion Regulations for Nagpur (2018) Metropolitan Regional Development Authority (Nagpur Metropolitan Area Development Plan)

P. Energy Efficiency and Social Value of Carbon: Standards and Guidelines

- 1. —. 2018. "Choosing by Advantages (CBA)." National Park Service Web Site. June 25. Accessed April 28, 2021. https://www.nps.gov/dscw/design_vafiles.htm.
- 2. —. 2018. "Life Cycle Cost (LCC) estimate." National Park Service Web site. June 25. Accessed April 28, 2021. https://www.nps.gov/dscw/design_vafiles.htm.
- Adelfio, Marco, Iqbal Hamiduddin, and Elke Miedema. 2020. "London's King's Cross redevelopment: a compact, resource efficient and 'liveable' global city model for an era of climate emergency?" Urban Research and Practice. doi:10.1080/17535069.2019.1710860.
- ASSOCHAM. 2020. GEM Sustainability Certification Rating Program (For Existing Buildings). Reference Guide, ASSOCHAM. https://greenassocham.com/property/ckfinder_img/files/ASSOCHAM_GEM_EB_Reference_Guide_Oct_2018-Final.pdf.
- 5. Bachmann, T. M. 2011. "Optimal pollution: the welfare economic approach to correct market failures." In Encyclopedia on Environmental Health, edited by J. Nriagu, 264-274. Burlington: Elsevier.
- Baker, Hannah, and Alice Moncaster. 2018. "Embodied Carbon and the Decision to Demolish or Adapt." ZEMCH 2018 International Conference. Melbourne, Australia: ZEMCH Network. 1-20. https://www.researchgate.net/profile/Alice-Moncaster/publication/323991043_EMBODIED_CARBON_AND_THE_DECISION_TO_DEMOLISH_O R_ADAPT/links/5b28c6f6aca2727335b73c46/EMBODIED-CARBON-AND-THE-DECISION-TO-DEMOLISH-OR-ADAPT.pdf.
- Bellia, Laura, Francesca R.d'Ambrosio Alfano, Joselito Giordano, Elvira Lanniello, and Giuseppe Riccio. 2015. "Energy requalification of a historical building: A case study." Energy and Buildings 95: 184-189. doi:https://doi.org/10.1016/j.enbuild.2014.10.060.
- 8. Berg, Fredrik, and Mie Fuglseth. 2018. "Life cycle assessment and historic buildings: energy-efficiency refurbishment versus new construction in Norway." Journal of Architectural Conservation 24 (2): 152-167. doi:10.1080/13556207.2018.1493664.
- Blundo, Davide Settembre, Anna Maria Ferrari, Alfonso Fernández del Hoyo, Maria Pia Riccardi, and Fernando E.García Muiña. 2018. "Improving sustainable cultural heritage restoration work through life cycle assessment based model." Journal of Cultural Heritage 32: 221-231. doi:10.1016/j.culher.2018.01.008.
- Blundo, Davide Settembre, Anna Maria Ferrari, Maria Pia Riccardi, Martina Pini, Jose' Francisco Garci'a, and Alfonso Pedro Fernandez del Hoyo. 2014. "The Life Cycle Approach as an Innovative Methodology for the Recovery and Restoration of Cultural Heritage." Journal of Cultural Heritage Management and Sustainable Development 4 (2): 133 - 148. https://www.researchgate.net/publication/263543053_The_Life_Cycle_Approach_as_an_Innovative_Me thodology for the Recovery and Restoration of Cultural Heritage.
- 11. Build Up: The European Portal for Energy Efficiency in Buildings. 2013. EQUER: A life cycle simulation tool for buildings. January 28. Accessed April 29, 2020. https://www.buildup.eu/en/learn/tools/equer-life-cycle-simulation-tool-buildings.
- 12. Cabeza, Luisa F., Alvaro de Gracia, and Anna Laura Pisello. 2018. "Integration of renewable technologies in historical and heritage buildings: A review." Energy and Buildings 177: 96-111. doi:https://doi.org/10.1016/j.enbuild.2018.07.058.
- 13. Central Public Works Department (CPWD). 2014. CPWD Guidelines For Sustainable Habitat. Technical Handbook, New Delhi: Jain Book Agency.
- 14. Considering embodied energy and carbon in heritage buildings A Review (2019) IOP Conf. Ser.: Earth Environ. Sci. 329 012002
- Construction LCA. 2012. CEN/TC 350 and EN 15804 What are they and why do I need to know about them? February 20. Accessed April 29, 2021. https://constructionlca.co.uk/2012/02/20/centc-350-and-en-15804/.
- 16. Costanza, Robert, and Daly E. Herman. 1992. "Natural Capital and Sustainable Development." Conservation Biology 37–46.

- 17. Department of Energy, United States of America. 2015. "Increasing Efficiency of Building Systems and Technologies." Chap. 5 in Quadrennial Technology Review: An Assessment of Energy Technologies and Research Opportunities, 144-181. Department of Energy, United States of America. https://www.energy.gov/sites/prod/files/2017/03/f34/qtr-2015-chapter5.pdf.
- Department of Environment and Heritage Protection, Queensland Government. n.d. Building services— Upgrades and installation. Technical Note, Department of Environment and Heritage Protection, Australia. https://australia.icomos.org/wp-content/uploads/Building-Services-Upgrades-and-Installation-QLD-DEHP.pdf.
- Department of Environment, Water and Natural Resources, Government of South Australia. 2013. Solar Panel Guidelines - Colonel Light Gardens State Heritage Area. Adelaide, South Australia: Department of Environment, Water and Natural Resources, Government of South Australia. https://australia.icomos.org/wp-content/uploads/Solar-Panel-Guidelines-Colonel-Light-Gardens-State-Heritage-Area-SA-DEWNR.pdf.
- 20. Dorpalen, Brenda. n.d. Valuing carbon in pre-1919 residential buildings. London: Historic England. https://historicengland.org.uk/content/docs/research/valuing-carbon-pre-1919-residential-buildings/.
- 21. Du, Chongyang, Fausto Freire, and Luis Dias. 2014. "Overview of Social Life Cycle Assessment." 2014 [avniR] conference: life cycle in practice. Lille, France. https://www.researchgate.net/publication/268577177_OVERVIEW_OF_SOCIAL_LIFE_CYCLE_ASSES SMENT.
- 22. Duffy, Aidan, Aneta Nerguti, Caroline Engel Purcell, and Peter Cox. 2019. Understanding Carbon in the Historic Environment. Research Report, Dublin, London: Historic England. https://historicengland.org.uk/content/docs/research/understanding-carbon-in-historic-environment/.
- 23. Embodied energy considerations for existing buildings (2011), Historic Scotland Technical Paper 13
- 24. Ferreira, J., M. Duarte Pinheiro, and J. de Brito. 2015. "Economic and environmental savings of structural buildings refurbishment with demolition and reconstruction A Portuguese benchmarking." Journal of Building Engineering 3: 114-126. doi:https://doi.org/10.1016/j.jobe.2015.07.001.
- 25. First Biennial Update Report to the United Nations Framework Convention on Climate Change (2015), Ministry of Environment, Forest and Climate Change, Govt. of India
- 26. Fredrik Berg, Life cycle assessment and historic buildings: energy-efficiency refurbishment versus new construction in Norway (2018), Issue 2, Journal of Architectural Conservation.
- 27. Getty Conservation Institute. 1998. Economics and Heritage Conservation. A Meeting Orga n i zed by the Getty Conservation Institute, Los Angeles: Getty Center,.
- 28. Global Alliance for Buildings and Construction, International Energy Agency and the United Nations. 2019. 2019 Global Status Report for Buildings and Construction: Towards a zero-emission, efficient and resilient buildings and construction sector. Global Status Report, United Nations Environment Programme. https://www.unep.org/resources/publication/2019-global-status-report-buildings-and-construction-sector.
- 29. Green Building Index, Malaysia. 2009. The Green Building Index: Malaysia's s International Green Benchmark. Explanatory Booklet, Kuala Lumpur, Malaysia: Green Building Index developed by PAM and ACEM. https://www.greenbuildingindex.org/resources/.
- 30. "Green Building Index. 2018. GBI CPD Guidelines. Guidelines, Kuala Lumpur, Malaysia: GBI Malaysia.
- 31. https://www.greenbuildingindex.org/Files/Resources/GBI%20Documents/GBI%20CPD%20Guidelines% 20V2.2%20-%20Updated.pdf."
- 32. Green Building Index, Malaysia. 2020. Green Building Index Resources. Accessed April 29, 2021. https://www.greenbuildingindex.org/resources/.
- 33. Greenhouse Gases Emissions of India (subnational estimates): Manufacturing Sector (2005-2015 series) (2019), supported by Shakti Foundation.
- 34. Grimmer, Anne E., Jo Ellen Hensley, Liz Petrella, and Audrey T. Tepper. 2011. The Secretary of the Interior's Standards for Rehabilitation and Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings. Technical Report, Washington, D.C.: U.S. Department of the Interior, National Park Service. https://www.nps.gov/tps/standards/rehabilitation/sustainability-guidelines.pdf.
- 35. Historic England. 2015. Energy Efficiency and Historic Buildings: Energy Performance Certificates. Guidance Note, Swindon: Historic England. https://historicengland.org.uk/imagesbooks/publications/eehb-energy-performance-certificates/heag015-eehb-epcs/.
- Historic England. 2016. Energy Efficiency and Historic Buildings: Insulating solid walls. Technical Guidance Note, Swindon: Historic England. https://historicengland.org.uk/imagesbooks/publications/eehb-insulating-solid-walls/heag081-solid-walls/.
- 37. Historic England. 2017. Energy Efficiency and Historic Buildings Application of Part L of the Building Regulations to historic and traditionally constructed buildings. Guidance Note, Swindon: Historic England. https://historicengland.org.uk/images-books/publications/energy-efficiency-historic-buildingsptl/heag014-energy-efficiency-partll/.

- 38. Historic England. 2018. Energy Efficiency and Historic Buildings: How to Improve Energy Efficiency. Guidance Report, Swindon: Historic England. https://historicengland.org.uk/imagesbooks/publications/eehb-how-to-improve-energy-efficiency/heag094-how-to-improve-energy-efficiency/.
- 39. Historic England. 2019. Heritage Counts 2019: There's No Place Like Old Homes: Re-Use and Recycle to Reduce Carbon. Research Report, Swindon: Historic England Archive. https://historicengland.org.uk/content/heritage-counts/pub/2019/hc2019-re-use-recycle-to-reduce-carbon/.
- 40. Historic England. 2020. Energy Efficiency and Traditional Homes. Historic England Advice Note 14, Swindon: Historic England. https://historicengland.org.uk/images-books/publications/energy-efficiency-and-traditional-homes-advice-note-14/heag295-energy-efficiency-traditional-homes/.
- Huertas-Valdivia, Irene, Anna Maria Ferrari, Davide Settembre-Blundo, and Fernando E. García-Muiña. 2020. "Social Life-Cycle Assessment: A Review by Bibliometric Analysis." Sustainability 12 (6211). doi:10.3390/su12156211.
- 42. ICRA Management Consulting Services Limited (IMaCS). n.d. Human Resource and Skill Requirements in Building, Construction Industry and Real Estate Services: Study on mapping of human resource skill gaps in India till 2022. National Skill Development Corporation (NSDC).
- 43. IGBC, CII. 2006. Building Management System (BMS). Technical Bulletin, IGBC, Confederation of Indian Industry (CII). https://igbc.in/igbc/redirectHtml.htm?redVal=showResourcessignin#contact-content.
- 44. Indian Green Building Council (IGBC). 2017. Green Railway Stations Rating System. Rating System Handbook, CII-IGBC for Indian Railways.
- 45. Interagency Working Group on Social Cost of Greenhouse Gases, United States Government. 2016. Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis- ¬Under Executive Order 12866. Technical Support Document (TSD), Interagency Working Group on Social Cost of Greenhouse Gases, United States Government. https://www.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf.
- 46. ISO 14040. 1997. ISO 14040: Environmental management Life cycle assessment Principles and framework. International Standard, Switzerland: ISO (International Organization for Standardization).
- 47. ISO 14044. 2006. ISO 14044: Environmental management Life cycle assessment Requirements and guidelines. International Standard, Switzerland: ISO. https://www.iso.org/standard/38498.html.
- 48. Kibert, Charles J. 2016. Sustainable Construction: Green Building Design and Delivery. Hoboken, NJ: Wiley.
- 49. King's Cross Central Limited Partnership. 2016-17. King's Cross Sustainablity Report. Sustainablity Report, London, UK: King's Cross Central Limited Partnership.
- Kumar, S., N. Yadav, S. Das, and S. Mathew. 2018. Green Vehicle Rating for 2 and 3 Wheelers in India – A consumer information system to grow the share of clean and efficient vehicles. New Delhi: Alliance for an Energy Efficient Economy (AEEE). https://aeee.in/green-vehicle-rating/wpcontent/uploads/2018/09/GVR-Report_Final.pdf.
- 51. Marique, Anne-Françoise, and Barbara Rossi. 2018. "Cradle-to-grave life-cycle assessment within the built environment: Comparison between the refurbishment and the complete reconstruction of an office building in Belgium." Journal of Environmental Management 224: 396-405. doi:https://doi.org/10.1016/j.jenvman.2018.02.055.
- 52. Murgul, Vera. 2015. "Reconstruction of the courtyard spaces of the historical buildings of Saint-Petersburg with creation of atriums." International Scientific Conference Urban Civil Engineering and Municipal Facilities, SPbUCEMF-2015. Procedia Engineering. 808-818. doi:https://doi.org/10.1016/j.proeng.2015.08.145.
- 53. National Park Service. 2018. "Value Analysis (VA) Files." National Park Service Web site. June 25. Accessed April 29, 2021. https://www.nps.gov/dscw/design_vafiles.htm.
- 54. Nunberg, Sarah, and Sarah Sutton. 2018. Life Cycle Analysis. Accessed April 30, 2021. https://www.sustainabilityinconservation.com/life-cycle-analysis.
- 55. Nunberg, Sarah, Sarah Sutton, and Matthew Eckelman. 2018. "Planning a Life Cycle Analysis Library and Beta Tool for Sustainable Cultural Heritage Preservation and Exhibition Practices." In Addressing the Challenges in Communicating Climate Change Across Various Audiences, edited by Filho W. Leal, B. Lackner and H. McGhie. Springer, Cham. doi:https://doi.org/10.1007/978-3-319-98294-6_32.
- Omar, N.A.M., and S. F. Syed-Fadzil. 2011. "Assessment of Passive Thermal Performance for a Penang heritage Shophouse." Procedia Engineering 20: 203 – 212. doi:https://doi.org/10.1016/j.proeng.2011.11.157.
- 57. Organisation for Economic Co-operation and Development (OECD). 2012. Greening jobs and skills. Accessed May 5, 2021. https://www.oecd.org/g20/topics/employment-and-socialpolicy/greeningjobsandskills.htm.
- 58. Pizzol, M., B. Weidema, M. Brandao, and P. Osset. 2015. "Monetary valuation in Life Cycle Assessment: A Review." Journal of Cleaner Production 86: 170-179. doi:10.1016/j.jclepro.2014.08.007.

- 59. Rossi, Barbara, Anne-Françoise Marique, Mauritz Glaumann, and Sigrid Reiter. 2012. "Life-cycle assessment of residential buildings in three different European locations, basic tool." Building and Environment (Elsevier Ltd.) 51: 395-401. doi:10.1016/j.buildenv.2011.11.017.
- 60. Rowe, Dr. David, Joanne Day, Jim Gard'ner, Paula Judson, and Stuart McLennan. 2009. Heritage Buildings and Sustainability. Technical Leaflet, Melbourne: Heritage Council of Victoria. https://australia.icomos.org/wp-content/uploads/Heritage-Buildings-and-Sustainability-VIC-Heritage-Council.pdf.
- 61. Rowe, Dr. David. 2009. Heritage Buildings and Energy Efficiency Regulations. Technical Leaflet, Melbourne: Heritage Council of Victoria. https://australia.icomos.org/wp-content/uploads/Heritage-Buildings-and-Energy-Efficiency-Regulations-VIC-Heritage-Council.pdf.
- 62. Shams, Shahriar, Kashif Mahmud, and Md. Al-Amin. 2011. "A comparative analysis of building materials for sustainable construction with emphasis on CO2 reduction." International Journal of Environment and Sustainable Development 10 (4): 364 374. doi:10.1504/IJESD.2011.047767.
- 63. Srivastava, Ravi S., and Ajit Jha. 2016. Capital and Labour Standards in the Organised Construction Industry in India: A Study Based on Fieldwork in the National Capital Region of Delhi. Project Report, New Delhi: Centre for the Study of Regional Development, Jawaharlal Nehru University, New Delhi.
- 64. Steinberg, Florian. 1996. "Conservation and Rehabilitation of Urban Heritage in Developing Countries." Habitat International 20 (3): 463–75.
- 65. Symons, Katie, Alice Moncaster, and Digby D. Symons. 2013. "An Application of the CEN/TC350 standards to an Energy and Carbon LCA of timber used in construction, and the effect of end-of-life scenarios." Australian Life Cycle Assessment Society (ALCAS) conference. Sydney Australia.
- 66. The Carbon Leadership Forum. 2019. Life Cycle Assessment of Buildings: A Practice Guide. Practice Guide, Department of Architecture, University of Washington, Washington, USA: The Carbon Leadership Forum. doi:http://hdl.handle.net/1773/41885.
- 67. The Ministry of Science, Technology and Innovation (MOSTI), Malaysia. 2010. KeTTHA's Incentives for Renewable Energy, Energy Efficiency and Green Buildings in Malaysia. Handbook, Putrajaya, Malaysia: Malaysian Building Integrated Photovoltaic (MBIPV) Project.
- 68. Throsby, David. 2019. "Heritage Economics: Coming to Terms with Value and Valuation." Chap. 14 in Values in Heritage Management: Emerging Approaches and Research Directions, edited by Erica Avrami, Susan Macdonald, Randall Mason and David Myers. Los Angeles: The Getty Conservation Institute. https://www.getty.edu/publications/heritagemanagement/part-two/14/.
- 69. Tirth, Vineet, Salem Algarni, Nitin Agarwal, and Abhishek Saxena. 2019. "Greenhouse gas emissions due to the construction of residential buildings in Moradabad, India." Applied Ecology and Environmental Research 17 (5): 12111-12126. doi:http://dx.doi.org/10.15666/aeer/1705_1211112126.
- 70. "Turner, R. K, D. Pearce, and I. Bateman. 1994. Environmental economics: An Elementary Introduction. Hemel Hempstead, UK: Harvester Wheatsheaf.
- 71. https://www.cabdirect.org/cabdirect/abstract/19931861592."
- 72. "UK Green Building Council. 2015. ""UK GBC Case Study: King's Cross."" UK GBC Web site. Accessed April 28, 2021.
- 73. https://www.ukgbc.org/sites/default/files/Kings%20Cross%20Development%20Case%20Study_0.pdf."
- 74. UK Green Building Council. 2015. Tackling embodied carbon in buildings. London: UK Green Building Council.
- 75. UNEP/SETAC Life Cycle Initiative. 2009. Guidelines for Social Life Cycle Assessment of Products. Guide, Belgium: UNEP/SETAC Life Cycle Initiative. https://www.lifecycleinitiative.org/wpcontent/uploads/2012/12/2009%20-%20Guidelines%20for%20sLCA%20-%20EN.pdf.
- 76. UNEP/SETAC Life Cycle Initiative. 2013. Methodological Sheets for Subcategories in Social Life Cycle Assessment. Methodological Sheets, Gothenburg, Sweden: United Nations Environment Programme and SETAC. https://www.lifecycleinitiative.org/wp-content/uploads/2013/11/S-LCA_methodological_sheets_11.11.13.pdf.
- 77. Wise, F., A. Moncaster, D. Jones, and E. Dewberry. 2019. "Considering embodied energy and carbon in heritage A review." IOP Conf. Series: Earth and Environmental Science. Cardiff, Wales: IOP Publishing Ltd. doi:10.1088/1755-1315/329/1/012002.
- 78. World Commission on Environment and Development. 1987. World Commission on Environment and Development: Our Common Future. Oxford and New York: Oxford University Press. https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf.
- Yim, Stephen Y. C., S. Thomas Ng, M. U. Hossain, and James M. W. Wong. 2018. "Comprehensive Evaluation of Carbon Emissions for the Development of High-Rise Residential Building." Buildings (MPDI) 8 (147). doi:10.3390/buildings8110147.

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